Products finishing

FRED W. VOGEL, Editor
(On leave of absence in the U. S. Armed Forces)

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Products finishing

THE MECHANICS OF COLOR FORMATION

MANY of the desirable properties sought by those engaged in metal finishing are concerned with the color of the final product. It might be well, therefore, to examine briefly some of the modern concepts of color mechanics and attempt to gain an appreciation of their practical significance.

The reason why one color differs from another is that the light which makes up the colors differs in wave length. The unit of wave length is one ten-millionth of a millimeter and is called the Angstrom. All visible light lies between 4000 A. and 7500 A. The shortest wave lengths are of violet-colored light; the longest are of red. Light of 5890 A. is yellow, that of 5200 A. is green, and so forth.

Theoretically an almost limitless number of colors exists between 4000 A. and 7500 A. Practically, however, it is outside the realm of possibility to distinguish visually more than a relatively small number of colors. For convenience the visible spectrum is divided into seven landmarks: red, orange, yellow, green, blue, indigo and violet. This can be remembered by the mnemonic word "Roygbiv."

The color of a transparent object is in reality the color of the light which it transmits. That of an opaque object is really the color of the light which it reflects. Although both may have white light fall upon them, which is a composite of most of the known colors, each of these objects absorbs nearly all colors but one. This one is transmitted by the transparent material and reflected by the opaque material, and is the color of the material concerned.

Most colors which we see from day to day are actually blends of several colors with one color predominating. A yellow pencil, for example, does not reflect light only of 5890 A. but includes in its reflected rays some at 5880 and 5900 A., less at 5870 and 5910 A., still less at 5860 and 5920 A., and so on. Strictly monochromatic light is probably not known, but it is approached very closely in the emission spectra of the chemical elements.

This is brought out strikingly in the case of mixing pigments. Although yellow and blue are complementary colors and will produce the sensation of white on the retina when added together, a mixture of yellow and blue pigments results in green. The blue pigment absorbs yellow and red but reflects blue and some green. The yellow pigment absorbs blue and violet but reflects yellow and some green. Hence, green is the only color left to be reflected by a mixture of the two.

All known colors may be duplicated by combining red, green and violet light in varying proportion. The question why this is so has never been solved, as it involves the complex physiology of the retina; but the fact has been common

experience for some time. These colors are therefore called primary colors, for this and for no other reason.

Any two colors of light which when superimposed upon each other produce the sensation of white light are called complementary. These phenomena are strictly physiological, however, for it has long been known that you can't make something out of nothing. Such light may appear white to the eye, but it can be proved that it contains only two colors.

The characteristics of the light falling upon an object may have a considerable bearing on the color of the light. If a body capable of reflecting red only is viewed in truly white light it will appear red. If, however, the incident light is lacking in red, the body will appear black. A material which is able to reflect most colors equally well will appear the same color as that of the light shining upon it.

Three of the most important definitions in the realm of color mechanics are the following: (1) tint, a pale or faint tinge of any color or a mixture of the color with white; (2) hue, the quality of a color, or color tone and (3) shade, the degree of luminosity of a color.

These in brief are the fundamentals of color mechanics. The next time you look at a nicely painted surface, ponder the myriad factors which combine to present that pleasing finished color to the eye.

Bryant W. Pocock

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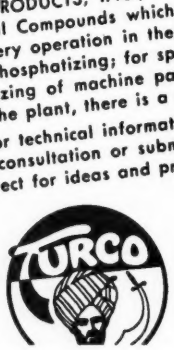

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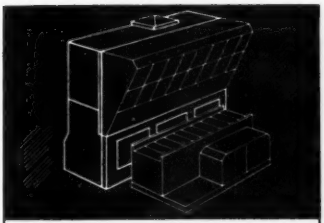

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Fig. 1—Flash plating tank with lid raised, showing two shafts (fixtures only visible) in the bath.

Chromium Plating Variable Speed Transmission Shafts

By FRANCIS A. WESTBROOK, M.E.

REEVES PULLEY COMPANY of Columbus, Indiana, has carried out a long series of experiments as a result of which it has been found that the shafts of their variable speed transmission units give improved performance when treated with flash chromium plating. This has been found to be true even under ordinary operating conditions and, of course, where humidity is excessive or corrosive fumes present, the improvement is still more marked.

Because of the non-corrosive properties of chromium the freshness of the

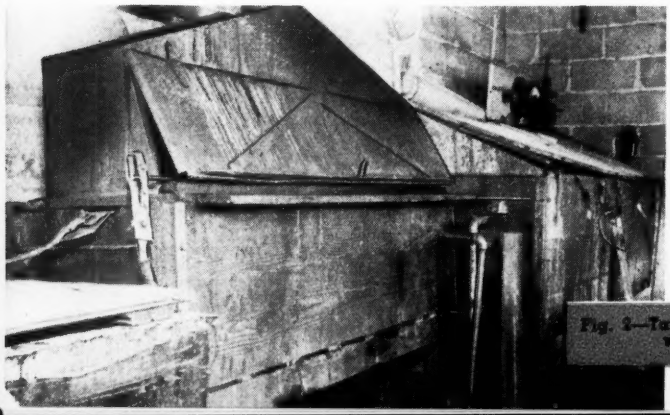


Fig. 2—Tank used for flash plating, with lid lowered.

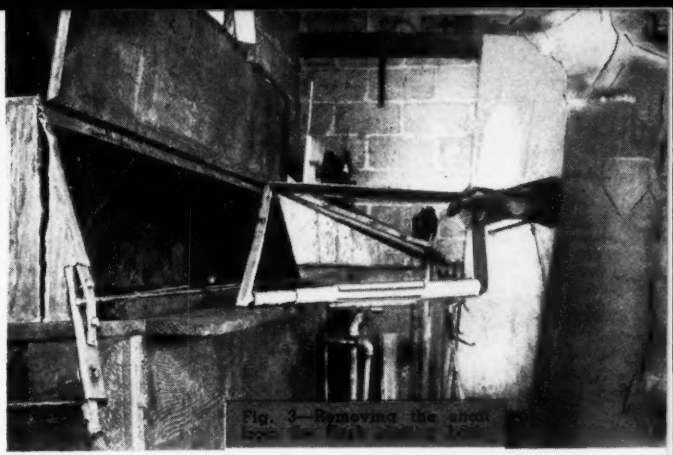


Fig. 3—Removing the sheet [illegible]

lubricant is maintained for longer periods, helping to prevent rust, undue wear and consequent breaking down of the shaft, keys and the bore of the discs. Avoidable stress on bearings and belts is thus eliminated, with the result that better performance and longer life of the equipment are realized.

The flash chromium plating is now applied, as a result of the research alluded to, to all shafts up to five feet long and for all sizes of variable speed units. The plating covers the entire shaft, keys and extensions whether standard or special. Hard chromium plating is used when the equipment is to be installed in locations where the humidity is unusually high or where there is running water near the drive which might result in chemical reactions.

When employed as outlined there are several important differences between flash plating and hard plating which are interesting because of the practical considerations involved. These are briefly explained in the following discussion.

In the first place, flash plating is considerably thinner than hard plating. On the shafts in question, for instance, the thickness of the flash plating varies from 0.0003 to 0.0004 in., while hard plating ranges from 0.006 up to 0.010 inch. Flash plating naturally requires considerably less time in the bath. From eight to ten minutes is generally sufficient, while hard plating requires from two to three and one-half hours, depending on the size of the work and the thickness of plating required. The temperature of the bath is also lower for flash plating. The economies of flash plating are obvious with respect to these items.

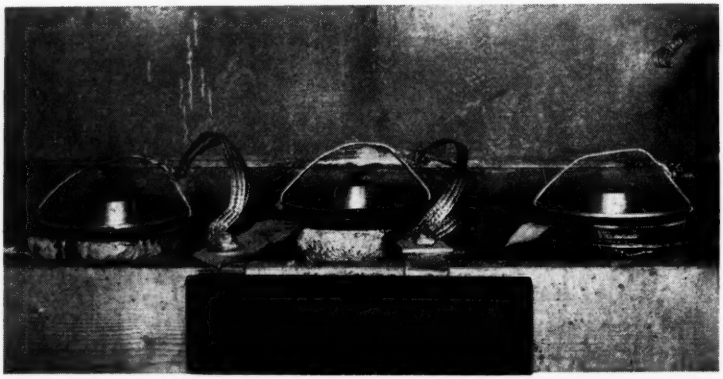
Another important difference is in the composition of the bath. The chromic acid content for flash plating is about 40 oz. to the gallon and the sulphate content is from 0.48 to 0.50 oz. per gal. with a current density of 1,200 amps. per sq. ft. On the other hand, the chromic acid content for hard plating is about 50 - 52 oz. per gal., the sulphate content around 0.68

Fig. 4—Shaft shown in rinsing bath. Note sheet metal guard over turned-down shaft extension to protect this part of the shaft from the bath. Shaft is shown in fixture in which it is immersed in the chrome bath.

to 0.70 oz. per gal., and the current density up to 4,000 amps. per sq. ft. In this instance, flash plating has been found to be more economical than hard plating.

This plating is done according to Reeves specifications in a local shop. After the shafts have been machined and the key seats cut, and so on, they are sent to the plating shop where they are fitted by hand into brackets and then suspended in the bath for the required period of time, the entire shaft being plated. The tanks for the flash plating are shown in the photographs, Figs. 1 and 2. Figure 3 shows a shaft being removed from the bath, after which it is placed in the rising bath of constantly flowing water (Fig. 4). After drying, the shafts are returned to the factory for fitting into the variable speed transmission units. This is a simple matter where flash plating is employed because the deposit is so thin that it does not affect the fitting of sprockets, gears or pulleys and consequently does not make necessary any changes in the original design and dimensions of the shaft and parts, nor does it necessitate machining or grinding after plating.

Some shafts that are hard plated carry special extensions of smaller diameter than the body of the shaft and must be further machined. In order to make this machining easier, these extensions are protected from the bath by sheet metal covers, or rubber and tape wrappings fitted over the ends, blanking out those parts before the shafts are immersed in the bath. These coverings are shown in Fig. 4. Lead inserts are also placed in the keyways to keep chromium from being deposited in them.



The discs used for the variable speed motor pulleys are sometimes plated according to the requirements of various users, such as in the dairy industry where machinery must be washed down daily. When the discs are received from the foundry they are ground to about 0.004 in. undersize. They are then sent to the plating shop where they receive a hard chromium plating so that they are oversize. After this they are again ground to exact size, leaving a coating of chromium 0.004 in. thick.

In some instances both discs and disc hubs are plated, in which case the entire casting is immersed in the bath. In other instances only the hubs are plated and, as they are an integral part of the castings, the lat-

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ter are handled in a special fixture which keeps the disc out of the bath while the hub is being plated. This arrangement is shown in Fig. 5.

These are interesting examples of the use of the two kinds of plating for the varying service conditions of the parts plated. It suggests that the advantages of coating of flash chromium plating may, in many cases, be well worth the extra cost where the hard chromium plating would not be justified. The saving in time alone is an important item when plants are operating on their present rush schedules.

(Photographs courtesy of Reeves Pulley Company)

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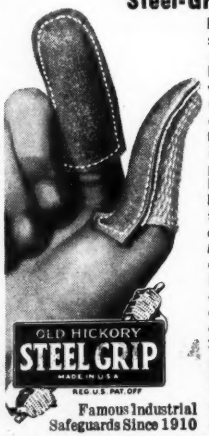

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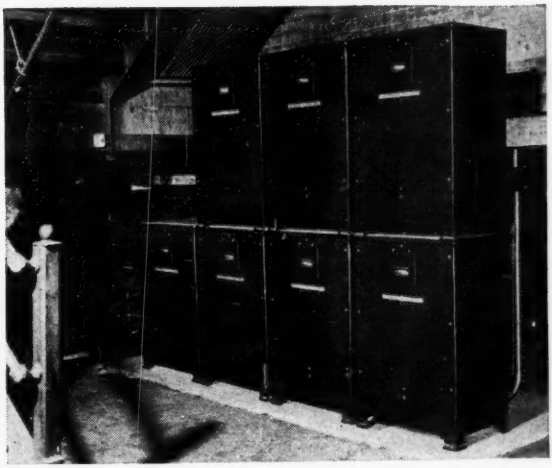
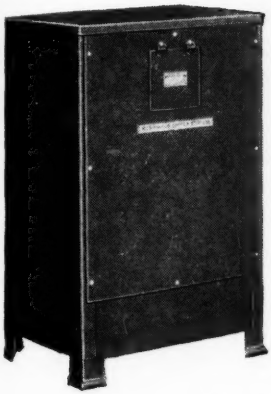
Latest and biggest counter-move in the safety movement is a grass-roots drive on accidents which has been planned for fourteen major war production centers. William A. Irvin, National chairman of the Fund, is visiting areas hampered by accidents in turning out the tools of war with maximum efficiency. He is accompanied by Colonel John Stilwell, president of the National Safety Council, and other representatives of that organization.

Progress made so far toward reducing the American accident toll is excellent. But it does not go far enough. "Our objective," Colonel Stilwell has said, "is to make safety an American watchword. We don't think it's too much to ask—that a man or woman should keep from getting hurt as a contribution to the war effort. And this must be done. We think the national-community plan of action against accidents is the best way to put the proposition before America."





A Problem in Electroplating and How It Was Solved

The Problem

An Eastern plating company had a contract for anodizing aluminum parts. The contract would be completed in about 9 months. The job would require a power supply of 500 amperes, 40 volts.

When, if ever, there would be another job requiring 40-volt equipment was uncertain. Most likely the next job would be low-voltage plating requiring 6 volts. The problem was: What equipment would serve both these widely different requirements.

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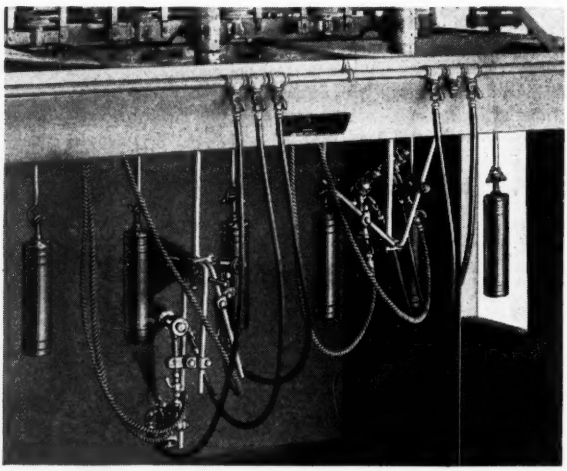
GENERAL ELECTRIC

Automatic Finishing Equipment In Step with War Production

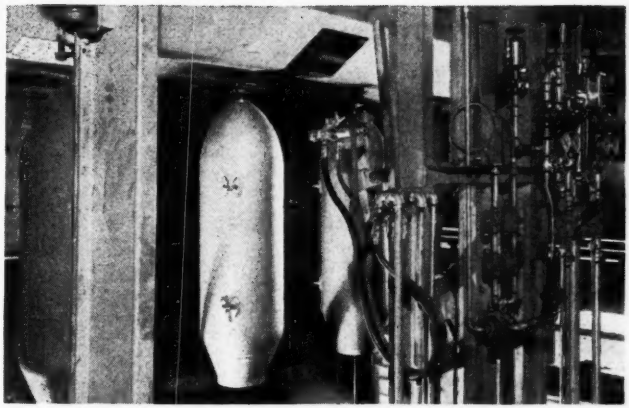
By JOHN E. HYLER

WHILE there are a good many automatic or semi-automatic spray-painting units that do not incorporate a conveyor of any kind, in the main it might be accurate to say that conveyorization is at the very heart of the automatic spray-painting idea. This is a system that has been applied in many ways for a number of years so that its present heavy application to the war effort was really to be expected. In times of peace, golf balls, smoking pipes, electric motors, and what have you were automatically spray-painted, and leaders in the spray-painting field were ready to furnish practically anything desired along this line, engineering it to fit a particular plant and a specific case, if that seemed to be necessary.

Objects that are cylindrical, round, flat, or even cubic in shape may be handled to very good advantage by the automatic process wherever there is sufficient volume of production to warrant an installation of automatic type equipment to handle it. It is possible to obtain considerably lower costs per unit painted, and at the same time get a better job because uniformity of motion is absolute where it is involved in a machine or mechanism, the human element being done away with so far as



The illustration shows an automatic spray-painting layout with overhead chain conveyor from which fire extinguishers are suspended during the spraying operation. *(Courtesy Paasche Airbrush Co.)*



Demolition bombs of 250-pound size are sprayed in this setup. The spray gun moves up and down as the revolving bombs pass before it. The bombs are suspended from an overhead conveyor. (*Courtesy The DeVilbiss Co.*)

actual application of the paint is concerned.

It will be found that once an installation of such equipment has been made, it will be sufficiently flexible to take care of a considerable variety of work by the simple expedient of modifying the work-holding fixtures or substituting other work-holding devices suitable for other jobs to be handled. Obviously, however, as large runs as can conveniently be arranged should be handled so that down time on the unit will be as low as possible.

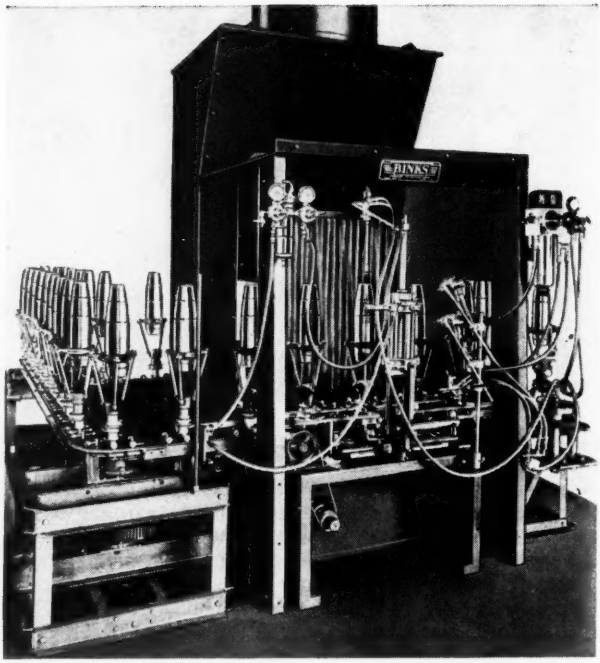
A large variety of automatic airbrush machines are available from different makers, by means of which metal and other materials may be lacquered, painted, oiled, or decorated. There is seldom any problem as to desired capacity of a given unit so far as the actual application of materials is concerned for one can simply increase the number of airbrushes, or use models that will deliver a greater amount of finishing materials. The question of capacity, therefore, usually resolves itself into the proposition of how fast the material can be loaded into the machine and unloaded.

Some automatic airpainting machines consist of a simple turntable mechanism, as far as the work carrier is concerned, and quite often the turntable is driven by compressed air drawn off the main line. Where the work-carrying layout is more elaborate, conveyor units of various kinds may be used; in this case the power for the conveyor may be a motor located as far as consistent from the actual paint-spraying operation.

Overhead Chain Conveyors for Steady Flow

In a good many cases, overhead chain conveyors have been used for the basis of an automatic spray-painting unit. Not long ago a unit of this type used for coating fire extinguishers came to the author's attention. The extinguishers are suspended on hooks as they pass the spray guns, the guns themselves being held on adjustable suspension rod mountings. As they come within the range of the airbrushes, the spray starts automatically and the extinguisher is rotated in the path of the spray, coating it uniformly all around. One spray gun coats the bottom of the extinguisher in the same operation. Herein lies the strategy of coating the units while they are suspended from an overhead conveyor.

The particular means of supporting and carrying the parts to be sprayed



This automatic unit for coating shells is equipped with an oscillating mechanism which rotates the shells in front of spray guns while the exterior is being coated; another feature is a work station where a spray gun is thrust down from above into the interior of the shell, spraying the interior.
(Courtesy Binks Mfg. Co.)

automatically depends primarily upon the size and kind of article being coated. Generally, these automatic machines are engineered and custom built for a given job, although as mentioned before, they are versatile in a considerable degree. Cylindrical bodies of the hollow type are often held on cup-type bases. Where there is a threaded portion at one point of an item and it is desirable to keep finishing material out of the threading, the mounting bases for the work are often designed to receive and to form a shield or a mask for that particular portion. Stencil shields have been successfully applied for flat objects.

On an automatic air painter, it is possible to apply one or more colors at a time, to put tinted shades in between colors, or to cut colors off sharply. Also, it is possible, by the use of interchangeable airbrush parts, to change colors rapidly in order to provide a different color of finish. The guns cut off and on automatically as the workpieces move out of and into range, thus avoiding unnecessary waste of finishing materials. Universal types of holders for the spray guns are usually employed to facilitate their adjustment to the exact point desired, and since the nozzles used on the spray guns usually give an adjustable spray that can be varied from a relatively fine line to a wide round or to a fan-type spray, a fine tint or a heavy coat of material can be produced. It is possible to put as many spray guns to work in as many positions as may be indicated for accomplishing any desired result.

Drying Oven Speeds Up Finishing

Regardless of whether a simple turntable unit is used or a machine of very elaborate type, and regardless of whether the conveyor unit is one of overhead type or a simple chain type or some special form, it is possible and practical to run the work, while still on its mountings, through an oven or drying unit to hasten the

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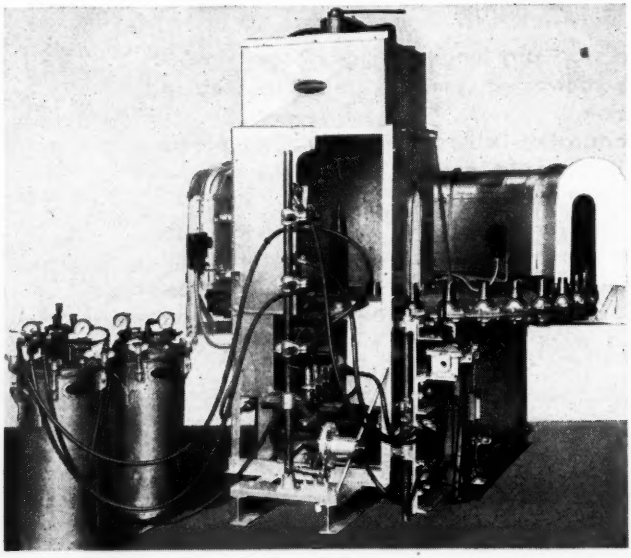
drying of the finish. This has been found of particular advantage on work requiring two coats. With a drying unit applied to a conveyor unit of judicious length, properly timed, the work may receive both coats while mounted without removing it from the conveyor between coatings, thus saving considerable handling expense.

One highly efficient unit now being considerably used for spray-painting the inside and outside of shells as they are carried along on a conveyor has an oscillating mechanism which rotates the shells in front of spray guns for spraying the exteriors. It then passes them on to another position where a spray gun from above is thrust down into the interior of the shell, which is still rotating, and gives the inside of the shell a thorough coating. This unit is provided with a device designed to prevent guns from spraying at any position on the conveyor where shells may be missing for any reason, thus economizing on finishing material.

Women Operators are Employed

Turntable units are being used considerably for spraying smaller shells. Since the work is both automatic and light excepting for the simple loading and unloading operation, unskilled labor can be used, and very often women operators are assigned to jobs of this type. Many of these turntable units are very high class pieces of equipment and one should not get the idea that because they are not as elaborate as some of the units used for larger work, they are any less important. In fact, one of their chief advantages is that they will turn out a large volume of work in a small amount of floor space.

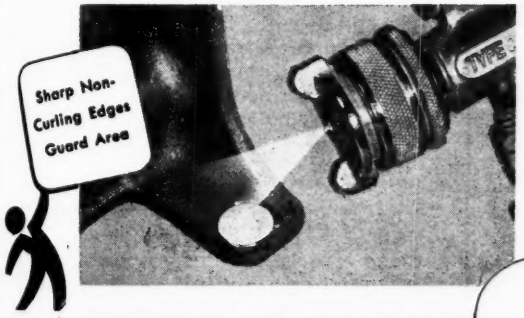
As handled in one plant, 250-pound demolition bombs move along on an automatic conveyor past a spraying layout provided by one of the large manufacturers of automatic spray equipment. This equipment manufacturer, like most of those who have been long engaged in the work, is providing equipment to handle ammunition of all shapes and sizes, including demolition bombs, projectiles, depth charges, shells, grenades, and cartridges. Practically all of this work lends itself



An electric eye controls the spray gun operating mechanism on this automatic sprayer for coating both the inside and outside surfaces of shells. Through the use of this device, a considerable saving of paint is effected. *(Courtesy Eclipse Air Brush Co., Inc.)*

AMAZING NEW METHOD OF

Masking Small Area



Kum Kleen Masking Stickers are pre-cut in any desired size or shape up to 8½" in width. They come individually mounted on a convenient carrying tape from which they are automatically dispensed from their container or are easily peeled off by hand. They are applied in a split-second without moistening, you simply press on. They hold securely to metal, glass, plastic and wood surfaces, give a clean, sharp and accurate masking edge. And like magic Kum Kleen stickers peel off in one piece without scraping or tearing and leave a clean surface—all adhesive remains on sticker.

Write for complete information or send sample order, give size and shape required. Request Bulletin 0000.

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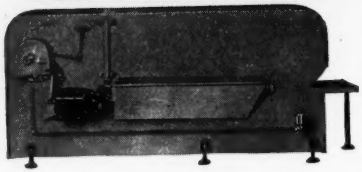
Kum-Kleen

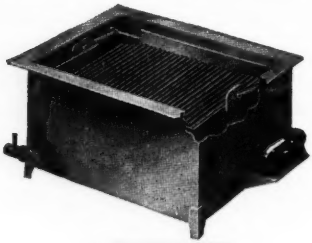
REMOVABLE MASKING STICKERS

METAL PARTS CLEANING
Low Cost -- Efficient



STURDY-BILT "Soaker-Hydro"
METAL PARTS CLEANER
Continuous Production

Combines long "soaking - process" plus Hydro washing Action for large production. Parts are loaded onto trays, passed through the "soaking tank"—then are rinsed to remove oil film and clinging chips — then subjected to a power wash. They are removed dry and ready for use or for the next manufacturing operation. Simplicity is the keynote of construction as well as operation. Send for complete details.



"SIMPLEX"
METAL PARTS CLEANER

This small, compact, automatic and mechanically simple Unit combines the two most positive methods of cleaning Metal Parts, Assemblies, Shells, Cartridges, Castings, Stampings, etc. A swishing action positively removes all grease, oil, dirt and metal chips that have been loosened during the "chemical action" of the "soak." Can be installed in different departments or in a series—one unit for cleaning, another for rinsing or rust prevention coating and others for special requirements. Send for "Simplex" bulletin for complete details.

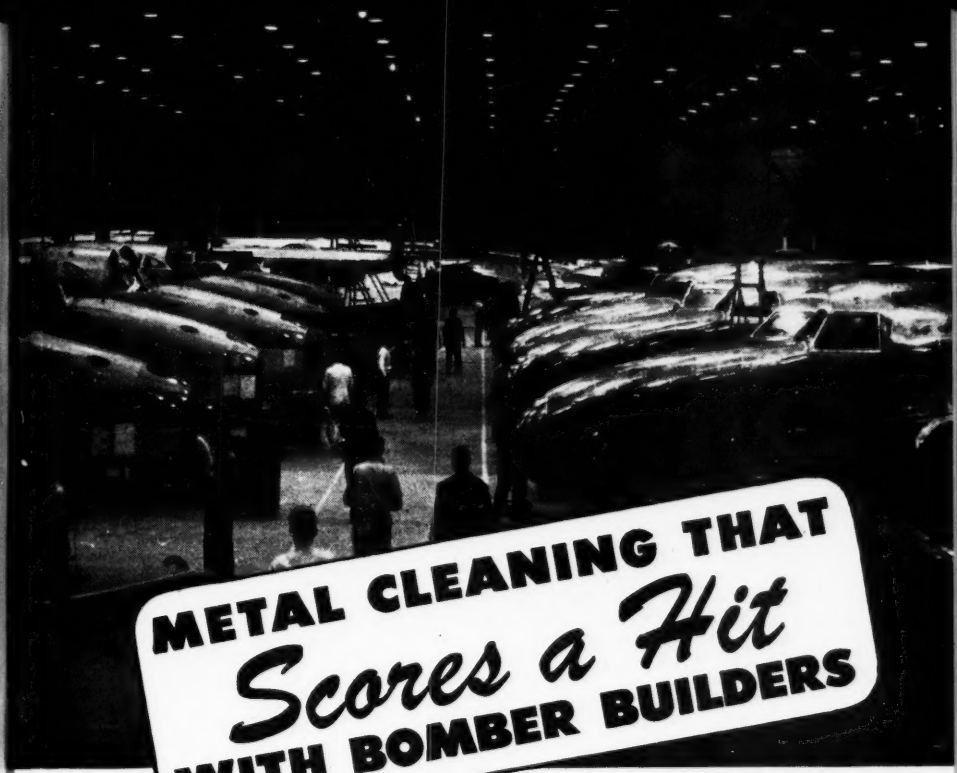
Sturdy-Bilt Equipment Corp.
DEPT. P-2 WEST ALLIS, WIS.

especially well for high production records in automatic spraying. One machine built by this firm utilizes an overhead chain - type conveyor for carrying anti-tank projectiles while they are being finished. A dip is provided in the overhead chain at the point where loading and spraying take place, and it is claimed that the machine can finish as many as 50,000 projectiles in a day. Special pendant-type carriers for the projectiles are arranged, each of the carriers holding a number of projectiles.

Insofar as the work - supporting spindles are concerned, those users of machines of the turntable type and machines which utilize the simpler forms of chain conveyors who take a farsighted view equip them in such manner that they can be converted for other duty after the war. Many of these machines have been built in the past with tapered work spindles so that they could be easily removed and as easily replaced with other work-holding devices. The spacing of such spindles on centers is usually determined by the size of the work-pieces to be revolved in front of the spraying guns. However, on a machine having spindles spaced for relatively small work, larger workpieces may be handled by removing alternating spindles, thus giving twice as much distance between the centers. Any other spindles may be removed in special cases as may be necessary or expedient.

Custom-Built Machines for High Production Rate

Some special-duty spraying machines are being built for various jobs on ammunition. One such machine has been developed especially for handling asphalt paint, spraying the inner surface of armor piercing shells. This unit is semi-automatic, can be handled readily by unskilled labor at a high production rate, and is manufactured by a firm of long experience



METAL CLEANING THAT Scores a Hit WITH BOMBER BUILDERS

SUN SPIRITS

"CLEANS AIRCRAFT PARTS BETTER...FASTER...CHEAPER"

New and exacting wartime standards presented a difficult problem to a certain large manufacturer of aluminum tubing for the aircraft industry. The problem—how to get satisfactory metal cleaning.

Because Sun Oil Engineers—widely known as doctors of Industry—had succeeded in solving a tough lubrication problem earlier in this same plant, they were called again. Conditions were studied and tests started with Sun Spirits. The cleaning met with every requirement.

Today they are doing a job of cleaning that has received the commendation of both government inspectors and the aircraft plants using their parts. More parts are cleaned better . . . faster . . . and at a lower cost than by their former method.

Sun Doctors of Industry and Sun Spirits can help you meet stiff war specifications, too. Avail yourself of their services. Write

SUN OIL COMPANY, *Philadelphia*

SUNOCO

SUN PETROLEUM PRODUCTS HELPING INDUSTRY HELP AMERI

in the production of spray-painting equipment. Another highly special triple-duty unit is designed to put an even coating of acid-resisting black in the charge container of four-pound incendiary bombs, a zinc primer in the detonating tube, and spray an overall coating of material on the outside before assembly. Yet, the machine does this work at the amazing rate of 2,000 parts per hour.

You may have wondered, at one time or another, just how arrangements are made for revolving work spindles or work holders in front of spray guns just as they reach the proper place. One method that has been used frequently is the mounting of a pinion on the lower end of the housing that carries the work-holding spindle, the pinion being in such position that it engages a section or a sector (sector in the case of a revolving turntable unit) of the rack in the spray area. The teeth of the pinion are forcibly carried past the rack while in mesh with it, thereby causing the spindle to revolve. The number of times the spindle must revolve while passing the spraying area can be governed by varying the diameter of the pinion and the number of teeth. The cutting in and out of the guns may be controlled manually in a few cases, but very often it, also, is automatic. Setups vary for this purpose, but frequently the engagement of a cam roller on the spindle or arbor deflects a lever arm to open an air valve and start the spray.

At Blink of the Eye the Trick is Turned

In this connection, you may have wondered how arrangements can be made for the spray to "skip" any work station where a workpiece has not been mounted, as mentioned previously in this article. Undoubtedly, different methods are used, but one that is especially worth noting is an electrical control setup involving the use of an electric eye. The electric eye setup involves the use of a light-sensitive photo-lectric cell on which a light beam from a specially designed light source is steadily trained. Any interruption of the light beam operates to close a circuit through which almost any required duty may be performed—if the setup is correctly designed. It is evident that a photo-electric cell and a light source may be set up in such manner that the workpieces must pass through and interrupt the light beam, thus operating the air valve. Thus it can be seen that when a work spindle which contains no workpiece passes, the light beam will not be interrupted, the valve will not be opened, and consequently the spray gun will not function.

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Other products for rust-proof finishing.

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HYDRO-WHIRL SPRAY BOOTHS

meet W.P.B. requirements

recover 30% SPRAY PAINT

WAR PRODUCTION NEWS

Conservation Division Urges Reclamation of Wasted Spray Paints

The War Production Board, in a move to salvage approximately 100 million pounds of war equipment to start immediately program for the recovery and reclamation of wasted spray paints.

A nation-wide salvage survey of the paint situation, just completed by the Chemical and Textile Units of the Conservation Division, emphasizes that all types of paint are urgently needed in the manufacture of Army and Navy equipment.

30% Recovery Possible

"It takes tremendous amounts of the familiar olive drab paint to put the finishing touches on our Army tanks, trucks, jeeps and other military machines," said S. Dunlap Pearlman, director of the Conservation Division. "Most of the things that now come off our war assembly lines must be sprayed with paint. Unfortunately, much of this paint is wasted. About 30% of the spray... This is where reclamation comes in. Industries operating processes can recover the paint and thinners used in these processes for re-use. Recovered finishings are effective and provide the required protection."

Tremendous volume of familiar olive drab paint is required for Army tanks, trucks, jeeps, and other military machines—practically all mass-painted by spray painting. According to a survey, great waste of paint is suffered in the process.

Chemical & Textile Units of Conservation Division of W.P.B. now emphasize the need of salvaging this paint. Aside from making possible substantial savings of critical materials, such reclamation of paint can effect great economies in the cost of painting the new war machines.

Hydro-Whirl Spray Booths—which employ the wet method process—are daily recovering 30% spray paint in the leading plants of the country. The high efficiency of Hydro-Whirl has been recognized throughout the industry. These units are built to accommodate practically every production requirement—for large or small products—in single or multiple booth arrangements—with or without product conveyors.

We shall be glad to discuss your particular production routine with your engineers.

BUY WAR BONDS

Industrial

The Dip Coater---An Instrument for Making Uniform Films

By HARRY FLEMING PAYNE
American Cyanamid Company

IT has long been recognized that uniformity in thickness of a film specimen is one of the essential requisites for the accurate evaluation of the properties of a given paint. It has been shown (6) that mechanical methods are necessary for producing such films, and many such methods have been proposed. Arlt (1) describes an automatic spraying apparatus and Dunn & Baier (3) the automatic doctor blade. The spinning disk method was used by Haslam (5), Sanderson (7), and Scofield (8). Dipping machines have been developed by Bruins (2) and the N. Y. Paint & Varnish Production Club (6). A general survey of the various methods is given by Gardner (4). The object of the present work was to develop a simple but reliable dipping method which could be produced commercially and, therefore, be made available to the surface coating industry as a standard method. Several types of apparatus were investigated to eliminate, if possible, the use of a motor. In one arrangement the rate of withdrawal of the panel to be coated from the paint bath was controlled by means of a perforated plunger moving in a cylinder containing liquids of different viscosities. However, owing to certain mechanical obstacles, this method was not refined and eventually was abandoned in favor of one using a motor.

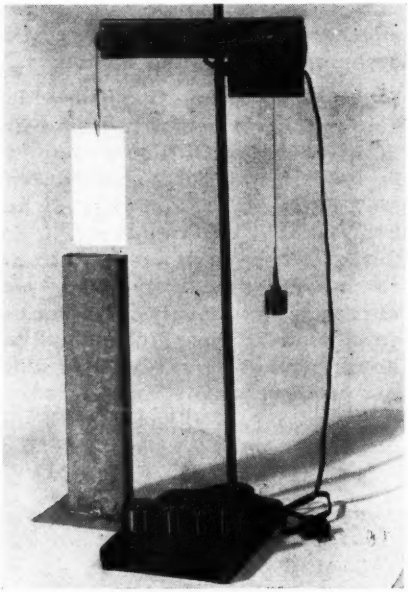


Fig. 1—Dipping Apparatus Used in Tests

A dipping apparatus utilizing a clock motor No. 1602-1160 R made by the Haydon Manufacturing Company, Forestville, Connecticut, and a set of Boston sprockets (Boston Gear Company) although giving excellent speed control yielded films with a horizontal striation. This was caused by a slight amount of lost motion in the gear reducer of the motor and finally was eliminated by replacing the clock motor with Bodine KYC-22RC (Bodine Electric Company, Chicago, Ill.).

This dipping apparatus was equipped with a set of drums furnishing withdrawal speeds of 2, 3, 4, 6, 8, and 12 inches per minute. A fish line was given two complete winds around the drum with a counterweight hung on one end and the panel on the other end as shown in Fig. 1. Arrangements are being made for the commercial production of a similar machine.

Application of Dip Coater

A series of four standard white baking enamels was made to determine the rate of withdrawal necessary for uniform thickness films and also the film thickness obtained with variation of viscosity of the coating material. The viscosity was measured in seconds required to flow from a No. 4 Ford cup at 78 deg. F. in the standard manner. The materials varied considerably in ability to flow, rate of setup, and composition; but the data showed clearly that withdrawal rates of 2, 3, and 4 inches per minute gave films of uniform thickness, and the faster rates (6, 8, and 12 inches per minute) were unsatisfactory. Subsequent work was, therefore, confined to the slower rates, but in most cases a hand-dipped panel was included for comparison. An olive drab lusterless finish and two primers (A and B) were used to show the variation which may be expected from materials containing a higher ratio of pigment to vehicle solids than that in the enamels. Two clear coatings—namely, the vehicles used in the first two enamels—illustrate the effect of pigmentation. Two other clears, both typical varnishes, were compared with the first two clears and a nitrocellulose lacquer. (Clear Varnish Charts Nos. 1 to 5.) These five clears are air drying coatings, but No. 6 and No. 7 are clear baking metal finishes such as are used on shell cases.

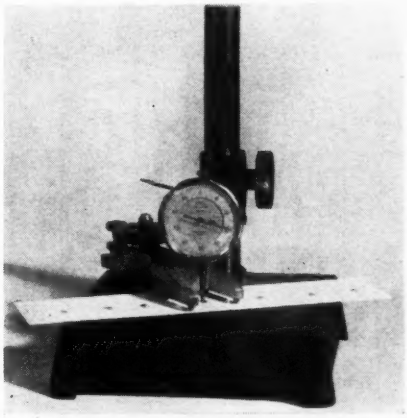


Fig. 2—Ames Dial Gage for Measuring Film Thickness

The films were dried under the following conditions before making film thickness measurements:

Enamels No. 1 and No. 2: Bake 60 minutes at 265 deg. F.
Enamels No. 3 and No. 4: Bake 30 minutes at 265 deg. F.
Olive Drab Lusterless: Air dry 48 hours
Primer A: Bake 60 minutes at 325 deg. F.
Primer B: Air dry 48 hours
Clears No. 1 to No. 5: Air dry 48 hours
Clears No. 6 and No. 7: Bake 15 minutes at 350 deg. F.

The air dry condition was maintained constant at 78 deg. F. and 50 per cent R.H.

Procedure

All panels were dipped under conditions of constant temperature and humidity, 78 deg. F., 50 per cent R.H.

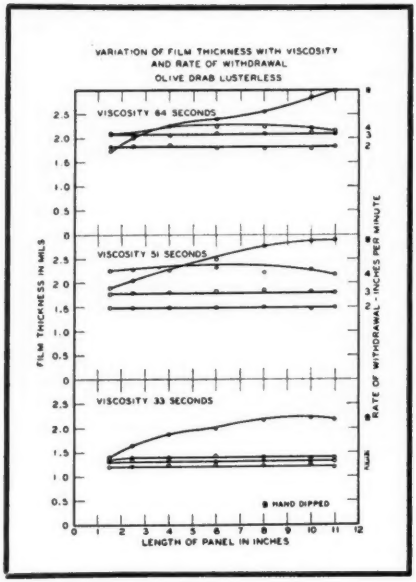

VARIATION OF FILM THICKNESS WITH VISCOSITY
AND RATE OF WITHDRAWAL
OLIVE DRAB LUSTERLESS
VISCOSITY 64 SECONDS
VISCOSITY 51 SECONDS
VISCOSITY 33 SECONDS
FILM THICKNESS IN MILS
RATE OF WITHDRAWAL - INCHES PER MINUTE
HAND DIPPED
LENGTH OF PANEL IN INCHES

Chart for Olive Drab Lusterless Finish

Cold rolled steel panels (auto body stock) were cleaned thoroughly with toluene and dried in a stream of compressed air free from oil or moisture. The cleaned panel was hung on a small wire hook attached to the fish line and lowered by hand into the container of surface coating to a depth of approximately ¼ inch below the surface of the coating. The panel was then withdrawn by the Dip Coater at a speed dependent on the size of drum used. The various size drums are interchangeable on the motor shaft by simple adjustment of the set screw. The coatings on the panels were then dried as shown in the above schedule.

The film thickness was measured by the dial gage method (Fig. 2). The coated panel was held firmly to the bed plate at four points by special clamps. The total thickness (film and panel) was measured, the film removed with solvent, and the thickness of the panel determined without changing the position of the panel under the gage. The film thickness is the difference between the first and second measurements. It is extremely important that the panel be held rigidly; the clamp was designed especially for this work. It is also desirable that any slight distortion in the metal panel be eliminated. This may be done by having a threaded steel pin with a slightly rounded end protrude through the bed plate about 0.001 inch directly under the dial gage spindle. An Ames Upright Gage No. 13 was used in this work. The film thickness may be measured by any other method of sufficient accu-

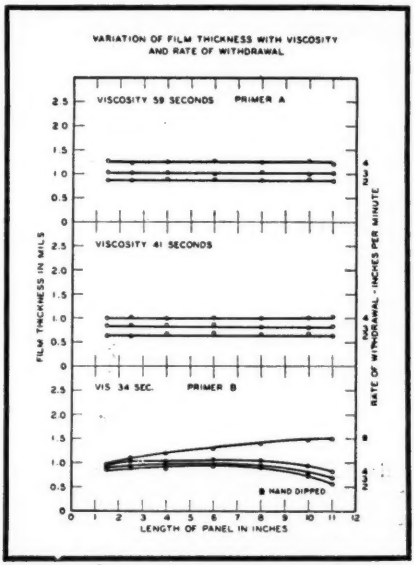
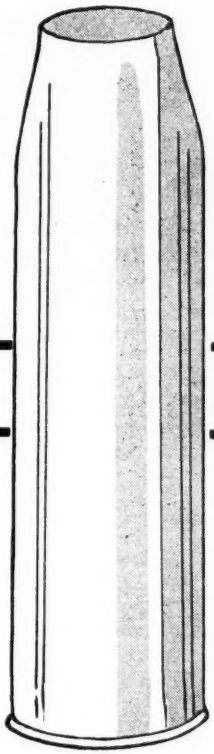

VARIATION OF FILM THICKNESS WITH VISCOSITY
AND RATE OF WITHDRAWAL
VISCOSITY 59 SECONDS PRIMER A
VISCOSITY 41 SECONDS
VIS 34 SEC. PRIMER B
FILM THICKNESS IN MILS
RATE OF WITHDRAWAL - INCHES PER MINUTE
HAND DIPPED
LENGTH OF PANEL IN INCHES

Chart for Primers A and B

racy, such as the microscope method described by Stoppel (9). The film

Now...

it's STEEL SHELL CASES instead of brass



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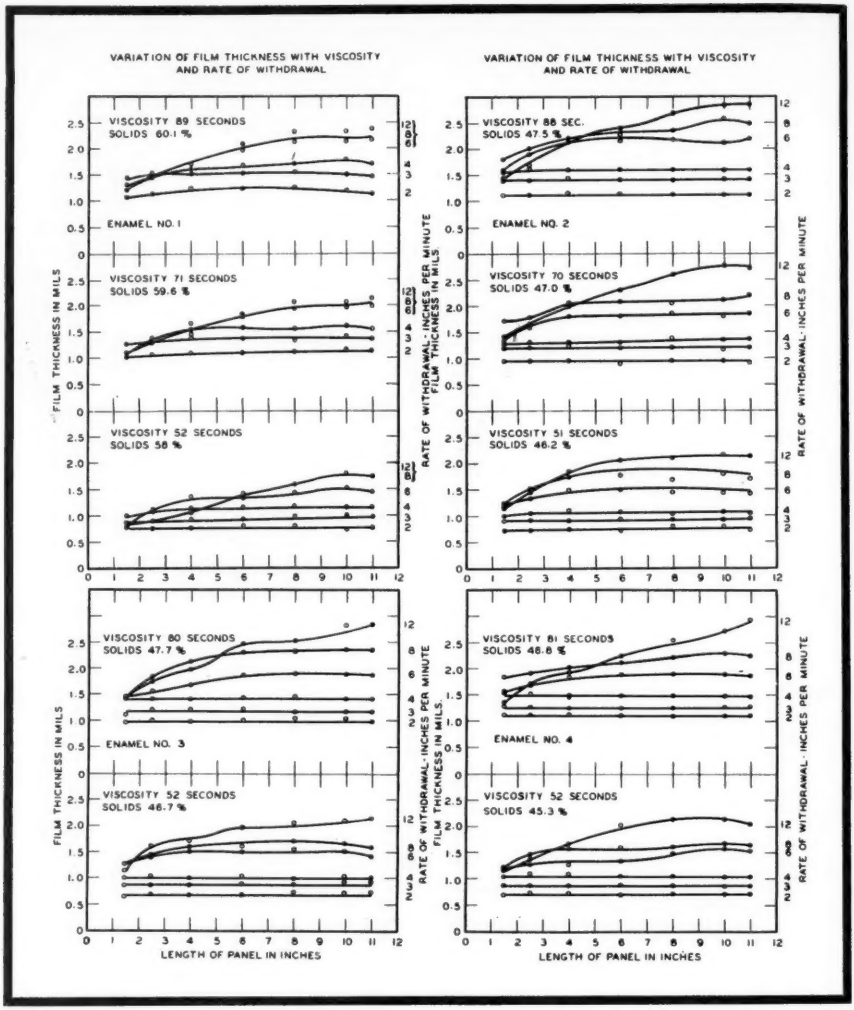


Enamel Charts Nos. 1 to 4

thickness was measured at seven points along the 12-inch panels with the results shown in the following curves.

Discussion of Data

The results from Enamel Charts Nos. 1 to 4 show clearly that withdrawal speeds greater than 4 inches per minute do not produce uniform films. Enamel No. 1, with mineral spirits solvent and consequently slower setting than the others, is not entirely uniform at the four-minute rate nor at the high viscosity. Viscosity

An Announcement

TO THE CUSTOMERS AND FRIENDS OF

THE FERBERT-SCHORNDORFER COMPANY

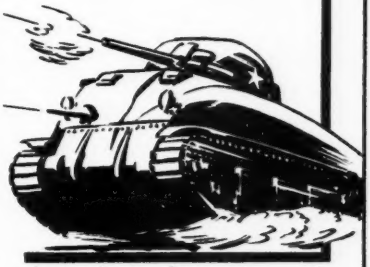
THIS COMPANY has become, by purchase, a subsidiary of the American-Marietta Company. No changes in administrative personnel are to be made. No changes are to be made in the policies and operations that have made this company a leader in the production of finishes for the automotive, metal finishing and marine paint field.

This coalition of business interests has been accomplished at a time when our volume is at an all time high, with 95.7% of output being war finishes. It will bring about no essential changes in our products nor in our customer relations, but rather will enable us to broaden the scope of our service through the combined facilities of both companies, and conversion to your needs upon the war's end will be expedited. The flexibility of our processes will permit a rapid adaptation to the new methods and new products that will inevitably come with the return of peace. It may not be too soon to discuss with us your needs for tomorrow, or the day after.

★ ★ ★ ★ ★

WAR PAINT

Ferbert-Schorndorfer Products are protecting United States tanks and fighting trucks on the battle fronts of the world—against burning African sun, jungle moisture and heat, bitter snows and freezing winds at the top of the world.



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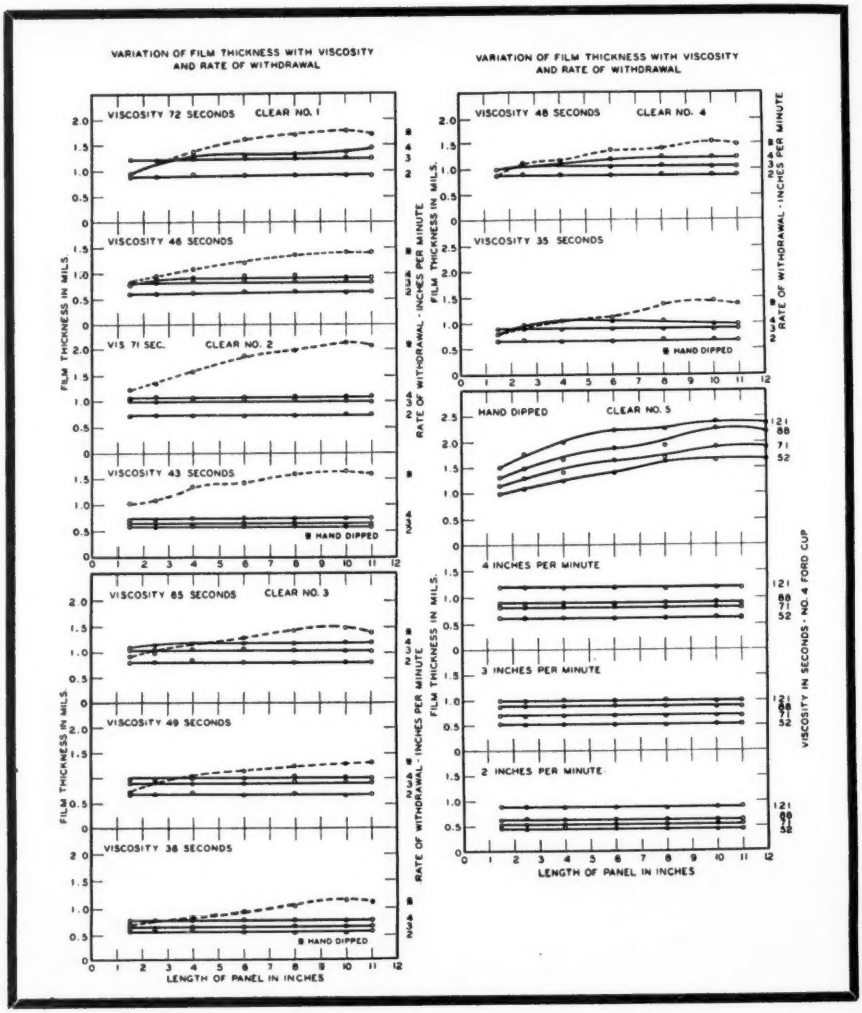
F-S

THE FERBERT-SCHORNDORFER CO.

12815 ELMWOOD AVE • CLEVELAND, OHIO

is much more important than the per cent solids in determining the film thickness.

Comparison of Enamel No. 1 (71 seconds) and Clear No. 1 (72 seconds) having the same vehicle shows that approximately equal film thickness is produced under the same conditions of viscosity and rate of withdrawal. The greater irregularity of the clear films at 4-inch withdrawal rate is evidence of the better flowing quality of the clear unpigmented material. Primer A having the same


VARIATION OF FILM THICKNESS WITH VISCOSITY AND RATE OF WITHDRAWAL
VISCOSITY 72 SECONDS
CLEAR NO. 1
VISCOSITY 46 SECONDS
VIS 71 SEC.
CLEAR NO. 2
VISCOSITY 43 SECONDS
@ HAND DIPPED
VISCOSITY 65 SECONDS
CLEAR NO. 3
VISCOSITY 49 SECONDS
VISCOSITY 36 SECONDS
@ HAND DIPPED
FILM THICKNESS IN MILS.
LENGTH OF PANEL IN INCHES
VARIATION OF FILM THICKNESS WITH VISCOSITY AND RATE OF WITHDRAWAL
VISCOSITY 48 SECONDS
CLEAR NO. 4
VISCOSITY 35 SECONDS
@ HAND DIPPED
HAND DIPPED
CLEAR NO. 5
4 INCHES PER MINUTE
3 INCHES PER MINUTE
2 INCHES PER MINUTE
RATE OF WITHDRAWAL - INCHES PER MINUTE
FILM THICKNESS IN MILS.
VISCOSITY IN SECONDS - NO. 4 FORD CUP
LENGTH OF PANEL IN INCHES

Clear Charts Nos. 1 to 5

OFFICIAL O.W.I. PHOTO

Dear Mr. [illegible]

It is a tremendous job you are [illegible] by the
successful one to date, as evidenced by the
of vital war supplies that is now rolling off Ameri-
production lines.

From our position as but a single unit in the vast in-
dustrial march to victory, we have some appreciation of
the immense problems and responsibilities that you and
the War Production Board face in coordinating national
production.

We know the task has just begun. We realize the imper-
ative need of teamwork and cooperation. In supplying
essential chemicals to key war industries we sometimes
feel that we are playing only a limited part in the war
program -- although there is no limit on our effort.

We are gratified, however, when we receive reports from
the field showing how our products have helped do a bet-
ter and faster job of turning out materials for war. One
such routine serviceman's report read, in part, "Pennsalt
Cleaner saved this large steel fabricating plant over
5000 lbs. of zinc per week in a galvanizing operation.
Production was speeded 25% by reduction of rejects."

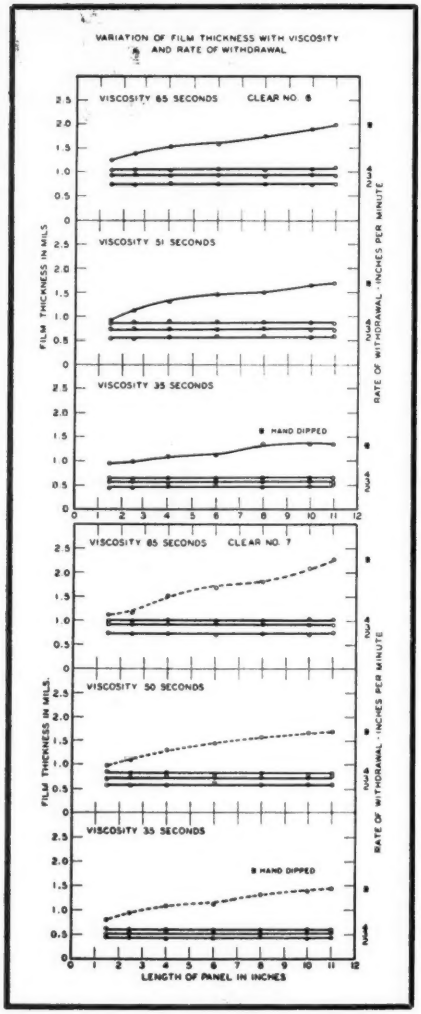
While this is just one example, it illustrates the kind
of job we like to do.

Yours for Victory,

Leonard S. Beale

PENN SALT
Chemicals

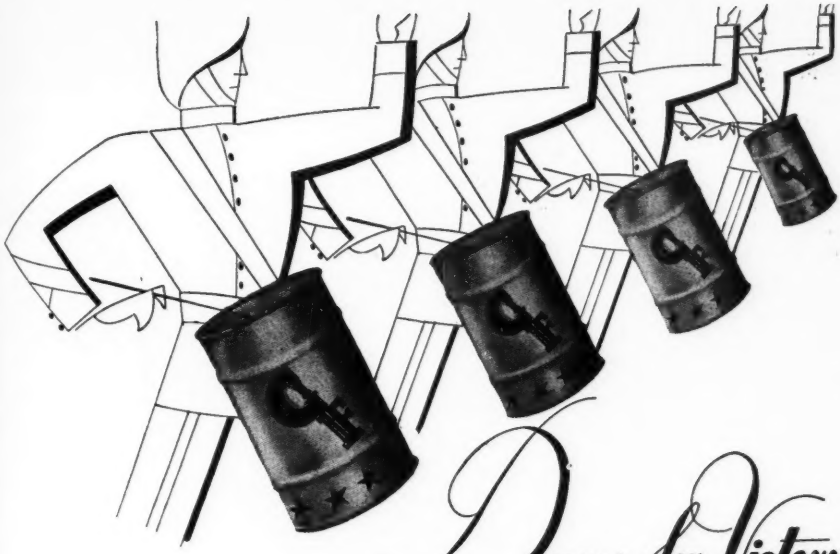
vehicle, but a greater pigment ratio, has less flowing quality than either Enamel No. 1 or Clear No. 1; therefore, uniform films are obtained at the 4-inch rate. When the flowing quality of a coating is reduced below a certain amount, it then becomes increasingly difficult to produce uniform films by the dip method. The decreased flow may be counteracted partially by lowering the viscosity, but this has definite limitations. The olive drab lusterless with considerably greater pigment ratio and different type of pigment requires lower viscosity for uniform films of normal thickness. The pigment ratio in Primer B is less than the olive drab, but this pigment has a definite tendency to flocculate, resulting in very poor flow and uniformity in film thickness. This material is not entirely satisfactory for dip coating and shows that the type of pigment and degree of dispersion must be considered to obtain satisfactory results.


VARIATION OF FILM THICKNESS WITH VISCOSITY AND RATE OF WITHDRAWAL
VISCOSITY 65 SECONDS CLEAR NO. 6
VISCOSITY 51 SECONDS
VISCOSITY 35 SECONDS
HAND DIPPED
VISCOSITY 65 SECONDS CLEAR NO. 7
VISCOSITY 50 SECONDS
VISCOSITY 35 SECONDS
HAND DIPPED
FILM THICKNESS IN MILS.
RATE OF WITHDRAWAL - INCHES PER MINUTE
LENGTH OF PANEL IN INCHES

Clear Charts Nos. 6 to 7

The extreme variation in film uniformity on the panels which were hand-dipped makes this method very unsatisfactory for making test panels. The effect of slow setting produced by mineral spirits has been referred to above, but may be seen again in comparison of Clears No. 1 and No. 2. It is particularly evident in the hand-dipped panels. Clears No. 3 and No. 4 are both thinned with mineral spirits, but No. 4 is slower setting than No. 3 because of a greater ratio of oil to resin. The greater irregularity of No. 4 at comparable viscosities and the 4-inch rate of withdrawal is at once apparent. The extreme opposite to this is the fast setting Clear No. 5 with which very uniform films were obtained at the 4-inch rate even at high viscosity. However, uniform films were not obtained with this material by the hand-dipping method.

Specification FSX-459 for shell case finishes requires a film thickness of 0.6 ± 0.1 mils. Clears No. 6 and No. 7 were tested for this specification, and an examination of the curves for these materials will show at once the viscosity and rate of withdrawal necessary for the desired film thickness. A



Drums for Victory

There's a steady beat of drums rolling from our factories — drums which bear the insignia of GENERAL and contain precision made protective coatings for airplanes, tanks, battleships and machinery of war. Can we help you beat delay, corrosion and inferior performance? Our GENERAL research staff is prepared to collaborate with you in perfecting the finish for your products. Just tell us what we can do for you and we'll drum up the solution for your problems. Have you received your copy of our comprehensive prospectus outlining our facilities? It's yours for the asking.

GENERAL INDUSTRIAL FINISHES
DIVISION • GENERAL PRINTING INK CORPORATION
PROTECTIVE COATINGS
100 SIXTH AVENUE • NEW YORK • N Y

series of films could be prepared by the Dip Coater covering a range of film thickness for a study of variation of film properties with thickness. In this way the optimum film thickness could be determined.

This work was done under conditions of constant temperature and humidity (78 deg. F., 50 per cent R.H.). It is well known that viscosity changes appreciably with temperature, and the temperature coefficient is not the same for a variety of coating materials. Where constant temperature is not available, it would be desirable to determine the viscosity of the coating under the same conditions as application and immediately before using. The rate of evaporation of the solvent from the film and consequently the setting time of the film is affected by the humidity of the atmosphere, but this effect is not so great as the temperature-viscosity factor and may be neglected over the normal humidity changes.

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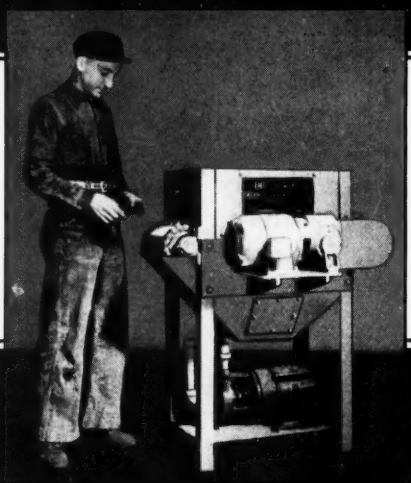
Join the Bond Brigade — enlist at least ten per cent of your income in War Savings Bonds and Stamps!

ARE YOU WASHING *small parts?*



This small, compact INDUSTRIAL Washing Machine handles parts from 5/32" in diameter to 6¾" wide x 2¾" high. The pump delivers a cold solvent solution at a pressure of approximately 25 pounds per sq. in. (A steam injector can be supplied for a heated alkali.)

This machine has a constant speed drive of 32 ft. per minute which gives a capacity of 16 sq. ft. of work per minute. Motors and pumps are mounted on machine.

Write for complete details.

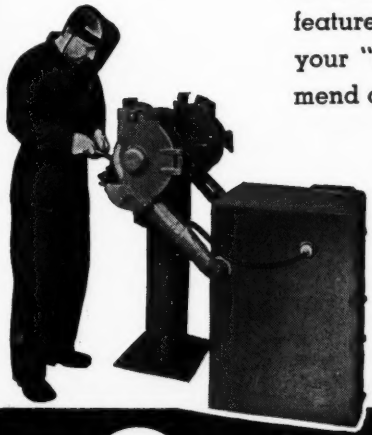
INDUSTRIAL
Washing Machine Corp.
291 BURNET ST., NEW BRUNSWICK, N. J.

It's more than just being *FASTIDIOUS*

. . . When you collect abrasive dust in your plant or machine shop, because *abrasive dust* exhausted from cutting, grinding, buffing machines is a dangerous saboteur of machines and a menace to employee health.

Today our all-out war production must not be hampered by lost man hours or machine breakdowns. Insure your production schedules by installing *Torit Dust Collectors* where needed. Torits are portable, simple to install, and economical to operate.

● Write today for bulletin giving Torit features, specifications, prices or give us your "dust problem" and let us recommend a solution, without obligation.



TORIT
MANUFACTURING CO.
314 Walnut Street
St. Paul, Minnesota

TORIT Dust Collectors
SELF-CONTAINED UNITS

Wartime Conversions Often Reveal Our Hidden Abilities

By JEFFREY R. STEWART

IN this wartime economy, one thing is certain . . . businesses should, if possible, convert to production of war materials and services. True, it is, some organizations are unable or unwilling to adapt themselves to such a change. These will be the ones who will be caught in the tight squeeze. Some will survive, but many will be victims. Now this change, especially in the metal finishing industry, can, just as the above title suggests, reveal our apparently hidden abilities to meet the many problems. As a counterpart, it can also be said that wartime problems also may expose our hidden weaknesses, if any. In other words, times like these will bring out the true color which does not express itself in normal times. The year of 1943 will tend to reveal the qualifications of the resourceful and also expose the weaknesses of the incapable.

Now, if there is any doubt as to the all-out effort of the paint industry to supply industrial finishes to the concerns who are finishing metal products, then glance at these facts and figures. They are representative of 1,200 manufacturers for the year of 1942.

10 per cent were 91 per cent engaged in defense production.
12 per cent were 72 per cent engaged in defense production.
17 per cent were 54 per cent engaged in defense production.
22 per cent were 31 per cent engaged in defense production.
39 per cent were 10 per cent engaged in defense production.

---

100 per cent total

To the producers and consumers of industrial finishes, the war brought first increased civilian activity, then an opportunity for considerable war business, and recently a great decrease in civilian activity. We have observed and felt the rapid conversion of industries from civilian efforts to the war program. There were several reasons for this rapid trend during the year of 1942, and the increased tendency to accelerate such policies during the year of 1943. These were:

1. The indifference on the part of the consumer.
2. Government restrictions of essential war materials.
3. Stabilization of the price structure as planned and later

. . . for GRAFLEX

HERE'S a precision job of manufacturing, if there ever was one! Machining of parts going into these finely-made GRAFLEX Cameras must be to the closest of tolerances. Parts must not have the slightest suggestion of a burr *anywhere*. In the GRAFLEX plant, LEA Methods and LEA Materials are being used to remove the burrs from parts such as those illustrated. On test, they proved most effective and economical, helping to maintain production at a high rate and to reduce rejections.

In countless other war-industry plants, the LEA way of removing burrs has been adopted. If your plant is not included among these, why not investigate the LEA advantages. Our engineers will be glad to help you work out proper methods.

2-LM-7

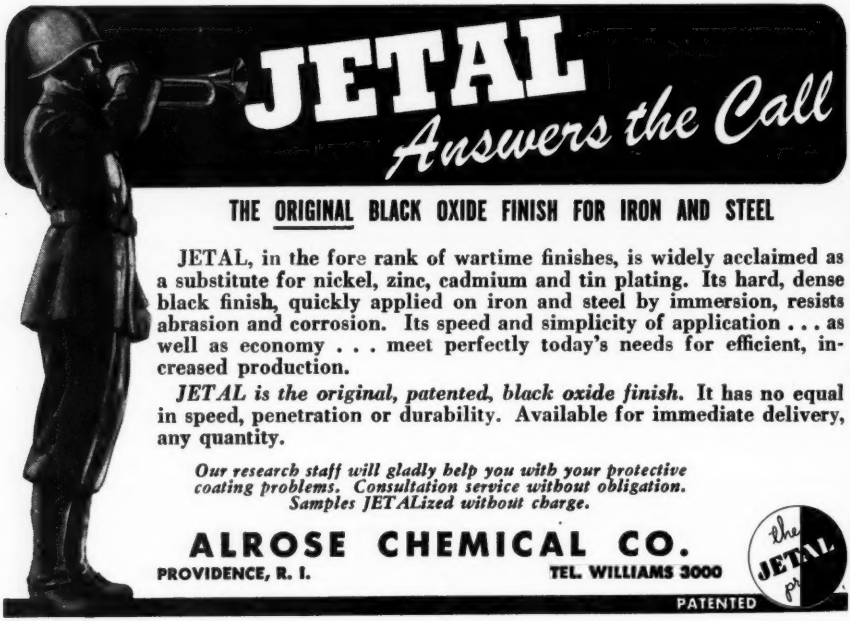
enforced by the Office for Price Administration.

4. In some cases, the selfish thought of "keeping in business," and, in other cases, for patriotic reasons.

These are the facts, and they cannot be changed. Rather, the policies must be adjusted to mesh with existing economic conditions. The expression used by Ernest T. Trigg, president of the National Paint, Varnish & Lacquer Association, in his address to the paint industry's "Convention-at-home," relative to the services of the industry in the war effort conveyed this suggestion. Instead of using the priorities test which is the so-called "War Use vs. Civilian Use," he said, "Does it fight, float or fly."

We should not be too quick to get the jitters about the widely publicized estimate of the number of small and medium-size businessmen who will be forced out of business in 1943 just because they have little or nothing to sell, thereby classifying them as innocent victims of World War II. Even if it is true that some 300,000 organizations will go out of business this year, we should not attribute all of these casualties to the present war conditions.

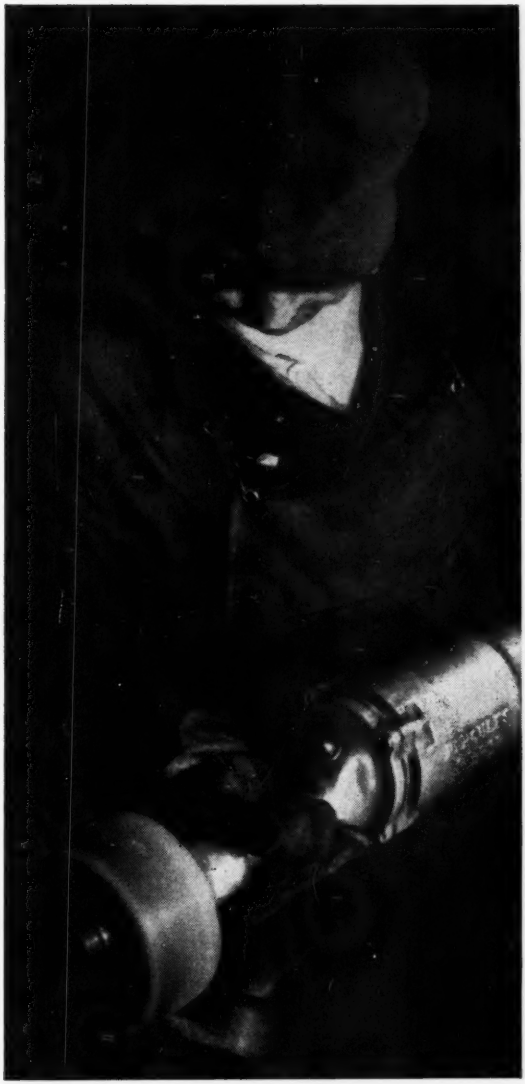
During normal times 200,000 business concerns liquidate annually. Most of these are the ones who just pay their bills and voluntarily go out of business. If this is true, and the Wall Street Journal says it is true, then we must not forget to subtract the 200,000 from the 300,000, leaving only 100,000 war casualties in business and industrial America. It is neither truthful nor fair to the "new-hungry" public to come out in the newspapers and over the radio and exaggerate a figure to the tune of 300 per cent. America is still the country where a business enterprise is most likely to succeed.


JETAL
Answers the Call
THE ORIGINAL BLACK OXIDE FINISH FOR IRON AND STEEL
JETAL, in the fore rank of wartime finishes, is widely acclaimed as a substitute for nickel, zinc, cadmium and tin plating. Its hard, dense black finish, quickly applied on iron and steel by immersion, resists abrasion and corrosion. Its speed and simplicity of application . . . as well as economy . . . meet perfectly today's needs for efficient, increased production.
JETAL is the original, patented, black oxide finish. It has no equal in speed, penetration or durability. Available for immediate delivery, any quantity.
Our research staff will gladly help you with your protective coating problems. Consultation service without obligation. Samples JETALized without charge.
ALROSE CHEMICAL CO.
PROVIDENCE, R. I.
TEL. WILLIAMS 3000
the JETAL process
PATENTED

The MAN who works for Two Bosses!

THIS man works for two bosses . . . you and Uncle Sam! His duty to you is to turn out top-notch work at top speed. His duty to Uncle Sam is to conserve the tools and materials he uses.

Help him to save on polishing grains by making sure your polishing wheels are properly prepared and properly used. Choice of grain and glue, method of applying and curing, wheel balancing and wheel speed while in use—all are important in getting the maximum efficiency from your polishing wheels. For further information write for the "Aloxite-TP" Manual of Polishing Practice.



CARBORUNDUM
REG. U. S. PAT. OFF.
ABRASIVE PRODUCTS

THE CARBORUNDUM COMPANY
REG. U. S. PAT. OFF.
Niagara Falls, N. Y.

Sales Offices and Warehouses in New York, Chicago, Philadelphia, Detroit, Cleveland, Boston, Pittsburgh, Cincinnati, Grand Rapids

(Carborundum and Aloxite are registered trade-marks of and indicate manufacture by The Carborundum Company)

Finishing Facts

Small Flat Cars Transport Work in Assembly Line Paint Shop

STRAIGHT-LINE production methods were kept in mind during the planning of the recently completed paint shop at the Westinghouse East Pittsburgh Works. Switchgear panels and switchboards are brought in for painting on flat-topped trucks that run on tracks from the assembly aisle through the paint shop and on out to the shipping floor.

A special feature of the booth is the method of handling the clean ven-

The "once-through" assembly line method is used in this new Westinghouse paint shop. Note the wire filters in the ceiling through which the air is drawn downward through the grill work in the floor.

Announcing! the STERLING 1000

New Electric Portable Sander

FASTER!
SMOOTHER!
BETTER!

Vibrationless!

Here is the sander you want and *need*... the NEW "Sterling-1000" Electric Sander.

For the first time in electric sanding history we announce the rugged, streamlined balanced "Sterling-1000," designed and built to meet today's heavy production demands and to overcome all previous objections to electric sanders. With this new vibrationless, streamlined balanced sander, we have eliminated all the curse of continuous breakdowns and nerve-racking vibrations to operators. Women operators like to use this new sander.

A NEW Kind of Sanding Action, Too

Orbital, circular. Thousands of abrasive grains cross and recross each other's paths with whirlwind speed and a *fast cutting*, scrubbing action that yields the smoothest surface you ever saw, on wood, metal, plastic, or composition. Excellent, too, for many rubbing and polishing operations.

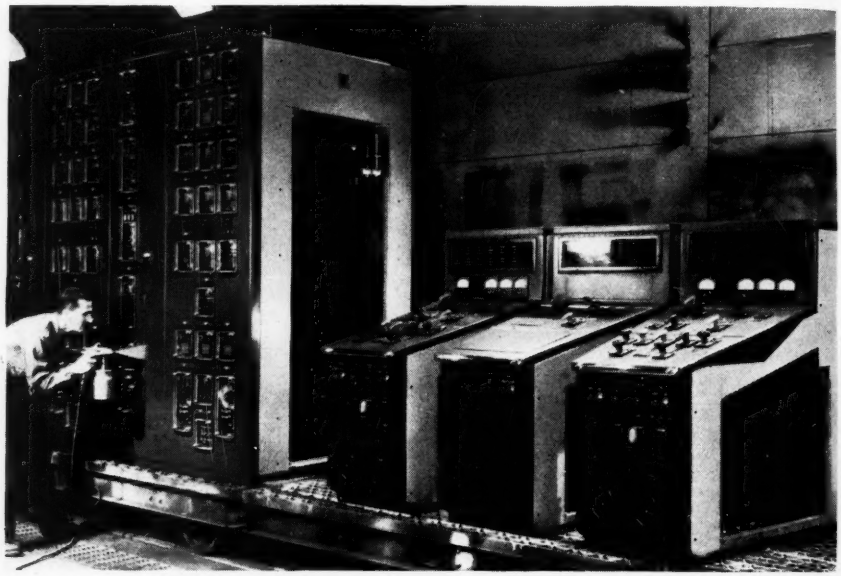
Streamlined, balanced, counter-balanced, with high-powered motor, built like a rock for long life and tough use.

Write today for the "Sterling-1000" folder.

STERLING TOOL PRODUCTS COMPANY
375 E. OHIO STREET **CHICAGO, ILLINOIS**

tilating air. A down draft system is used whereby air from outside the booth, which is 70 x 25 x 15 ft. high, is drawn through the ceiling. The air is cleaned as it passes through 180 wire mesh washable filters, each 20 x 20 x 2 in. thick, covering the entire ceiling area. Paint spray in the room is carried downward with the air through open grill work in the floor and is deposited on a water surface in a pit covering nearly the area of the floor. The water in the pit is recirculated by four motor-drawn pumps each having a capacity of 5,000 gallons. Makeup water is supplied to retain the proper water level.

The air drawn downward through the floor grill is expelled to the shop by four fans, each driven by a 15-h.p. motor. Total air exhausted is about 200,000 cu. ft. per minute, the equivalent of 380 air changes per hour.



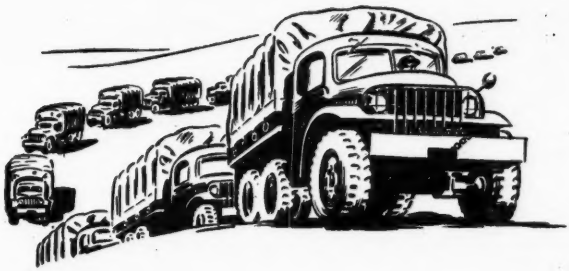
Finishing touches are given to complicated switchboards and switchgear panels in the paint shop at the Westinghouse East Pittsburgh Works. The units are moved in from the assembly aisle on small flat cars, are painted, and sent on to the shipping floor.

Production, Safety, Morale—and Color

THOUGH interest in color during war times seems to center around the art of camouflage, its application to the home front of industry is also important. According to the Color Research Laboratory of the Eagle Printing Ink Company, Division of General Printing Ink Corporation, New York, N. Y., color in factories and offices is accomplishing much to speed up work and to help thwart a rather tragic increase in accidents brought about by the demand for speed and by the influx of new and relatively inexperienced labor.

To obtain the most utility from color, here are some of the functions being applied:

Red as a danger signal is giving way to a more prevalent use of yel-



Supply Trains Roll with the Help of ACP Products and Processes

Automotive manufacturers who have converted for war know the help they can get from ACP Products and Processes . . . Chemicals and their applications which grew with and contributed so much to the mass production of American automobiles.

DEOXIDINE, the acid cleaner which made mass production of all-steel auto bodies possible, is doing its war-time job on the Army's prime movers . . . preparing steel perfectly for painting, eradicating rust and neutralizing rust-producers.

KEMICK holds to and protects metal surfaces even when heated to redness . . . has been used all over the world on exhaust manifolds.

FLOSOL wets oily surfaces, is an exceptional soldering flux for steel, brass, copper, tin, terne plate and zinc.

These three are typical of the many ACP Products and Processes, well known in peacetime, that are serving in the war effort.

Others include: RODINE, the pickling inhibitor that saves steel and acid, prevents pitting and embrittlement; CUPRODINE that provides a dense, bright copper coating on steel by simple immersion; LITHOFORM for coating galvanized iron before painting to prevent peeling and scaling. These are typical ACP Products. The experience of the ACP laboratories in metal treating and finishing processes is at your service.

AMERICAN CHEMICAL PAINT CO.

MAIN OFFICE AND WORKS
AMBLER . . . PENNA.

ACP

CHEMICALS ACP PROCESSES

DETROIT, MICH., 6335 Palmer Ave., E.
CANADIAN BRANCH
WALKERVILLE . . . ONT.

low, yellow-green and orange—all of which have much higher visibility and noticeability.

Machines are being painted in lighter tones, both to reduce shadows and reflect more light and to build up better contrast with materials handled.

Brighter colors on floors increase illumination efficiency and throw light on the underside of equipment.

Colorful walls offer relief from monotony and a chance to relax eyes which are tired by critical seeing tasks.

Whole plants are being studied, having in view color in its relation to traffic, materials and operations. This is color "engineering" in the true sense of the word. The Eagle Printing Ink Company will be glad to send special reprints on the subject to those interested. Address requests to the Color Research Laboratory, Eagle Printing Ink Company, Division of General Printing Ink Corporation, 100 Sixth Ave., New York, N. Y.

HOW TO USE

McKeon's "Liquid Sulphur"

For Removing Copper Plating

1. Remove surface grease from work. 2. Immerse in 12% McKeon's "Liquid Sulphur" solution. 3. Rinse in cold water. 4. Immerse in 20% sodium cyanide solution. 5. Rinse in cold water.

Write for free sample.

SULPHUR PRODUCTS CO.

GREENSBURG • PA.

Anodic Treatment of Aluminum

AN electrolyte for use in the anodic treatment of aluminum, according to British Patent 537,474, is composed of from 3.5 to 7 per cent by weight of chromic acid, 1 to 3 per cent of a polyhydric alcohol such as glycerine and an aldehyde such as formaldehyde together with boric acid in a proportion of 0.3 to 0.5 per cent. It is also preferable to have present soluble chromates in quantities not exceeding 2 per cent.

Substitutes. The Chemical Publishing Company, Inc., 234 King St., Brooklyn, N. Y., has announced the publication of "Substitutes" written by H. Bennett. The book describes new products, processes and materials to be used as substitutes and alternatives for the numerous raw materials which have become unavailable because of the war. The author is said to be an expert in this field. He has not only given of his wide knowledge of substitutes for numerous products, but has also included the results of the vast experience of many chemists, engineers and technical workers.

The contents include substitutes for metals, plastics, textiles, rubber, chemicals, drugs, resins, waxes, paints, oils, fats, and many other products. A plan is also given that shows how to determine whether a substitute material is really suitable and whether it will stand up under conditions of marketing and use. "Substitutes" should be extremely interesting to all branches of industry where shortages are an everyday problem. Price, $4.

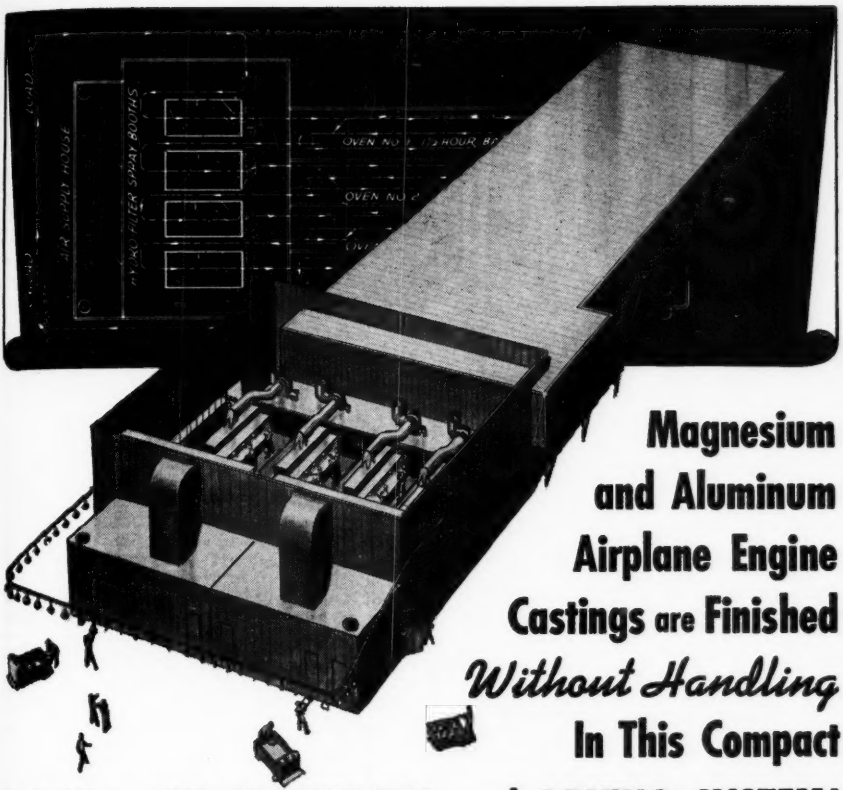
"GAS-STOPPO"

ACID INHIBITOR TO CONTROL PICKLING

"NEP" and SUMFOAM.. for 28 Years

THE WM. M. PARKIN CO., Pittsburgh, Penna.

CHEMICAL ENGINEERS TO STEEL INDUSTRY



Magnesium and Aluminum Airplane Engine Castings are Finished *Without Handling* In This Compact MAHON SPRAY-PAINTING and DRYING SYSTEM!

Cooperating with the aircraft industry in the manufacture of one of the best-known airplane motors, Mahon engineers have developed a wide variety of *specialized* equipment for the processing and finishing of magnesium and aluminum castings . . .

Dust collecting systems, metal cleaning equipment, core baking equipment, tung oil impregnating systems, shrink ovens — and the spray painting and baking system, pictured above, one of more than a dozen similar systems, most of which already are in operation.

This installation handles a vast volume of production smoothly and speedily—yet, so compactly has it been designed, it occupies a remarkably small floor area. Every phase of operation—conveying, filtered air supply, fume removal, heat control, cooling—is *automatic*. Except for loading and unloading of conveyor lines and for spray painting operations, manpower has been entirely eliminated.

Throughout the aircraft industry—and in many other fields of war production—Mahon *processing* and *finishing* equipment is constantly being created and utilized to keep production rolling on a faster and more economical basis. If a problem exists in your plant—consult Mahon engineers.

THE R. C. MAHON COMPANY · DETROIT · CHICAGO

Metal Cleaning Machines, Rust Proofing Machines, Hydro-Filter Spray Booths, Ovens of All Types, Filtered Air Supply Units, Hydro-Filtered Dust Collecting Units, Hydro-Power Dust Collectors—and Many Other Units of Special Production Equipment—Including Complete Finishing Systems.

MAHON

News OF THE INDUSTRY

Former President of Cleveland Credit Men Given New Duties at The Osborn Manufacturing Company

Henry T. Riddick, with The Osborn Manufacturing Company, 5401 Hamilton Ave., Cleveland, Ohio, for the past 32 years, has been named sales service

Henry T. Riddick

manager of the company's brush division. He will continue to serve as credit manager, which office he has held for many years. Active in the affairs of Cleveland credit men, Riddick two years ago served as president of the Cleveland Credit Men's Association.

His long record with the Osborn Company is notable for the friendly customer relations which he has helped to build. He is mentioned in the recent book, "Men, Machines and Morals," a study of the life of Franklin G. Smith, who in 1942 celebrated his 50th anniversary as executive head of the company. The author, Julian Street, mentions Riddick as one of the able men who helped make the Osborn Company what it is today—the world's largest manufacturer of industrial brushes and foundry moulding machines. Riddick began his career with the company as timekeeper and the Osborn president quickly recognized his capabilities.

Riddick is also chairman and charter member of the Cleveland Office Managers' Club and a member of the Cleveland Export Club.

American-Marietta Company Acquires Cleveland Plant

Acquisition of The Ferbert-Schorndorfer Co., industrial paint manufacturer with plant and home office in Cleveland, by American-Marietta Company, 43 E. Ohio St., Chicago, Ill., has been announced by Grover M. Hermann, president of the latter company.

The Ferbert-Schorndorfer Co. will be operated as an American-Marietta subsidiary, with David Andrew, who joined the company in 1930, continuing as its president, and Guy Bartholomew, with Ferbert-Schorndorfer since its inception in 1922, as vice-president. Hermann, who has been named board chairman of the Cleveland company, said no changes

in management personnel were contemplated.

American-Marietta Co. has other paint manufacturing plants in Kankakee, Ill.; Marietta, Ohio, and High Point, N. C. The company specializes in industrial finishes and in maintenance paints for industry, while The Ferbert-Schorndorfer Co. has specialized in automotive and metal finishes. More than 95 per cent of the latter company's current production is war finishes.

Detroit Rex Opens New Pacific Office

The Detroit Rex Products Company, metal cleaning engineers, have moved their Los Angeles office to new and larger quarters at 1506 Santa Fe Ave. According to the announcement, the new offices, occupying more space, will enable the company to offer the best possible cleaning service to industries in the Southern California territory.

Mr. S. B. Crooks, transferred from the Midwestern Region with offices in Chicago, became manager of the Pacific Region. His new headquarters are in the Los Angeles office. Mr. W. A. Vensel, formerly Pacific Region Manager, supervises sales and service in the southern states.

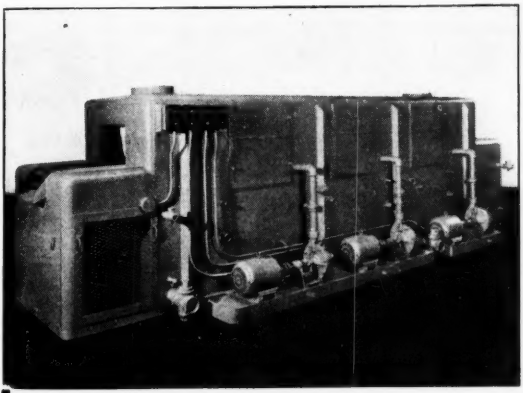
Ingle R. Shue Appointed Member of Committee of American Standards Association

Ingle R. Shue of the Gardner Machine Company, Beloit, Wis., has been appointed a member of the American Standards Association's Sectional Committee on the Safety Code for the Use, Care and Protection of Abrasive Wheels.

American Foundry Equipment Establishes Metal Washing Division

American Foundry Equipment Co., 555 S. Byrkit St., Mishawaka, Ind., recently announced the addition of a Metal Washing Division for designing and manufacturing washing machines for industrial purposes. The new division will design and build machines for the removal of chips, dirt, grease and oil

HOWARD ENGINEERING...



DESIGNS AND BUILDS ALL TYPES METAL CLEANING FINISHING AND PROCESSING MACHINERY

•

Inquiries Invited

•

New Catalog On Request

Write to:

HOWARD ENGINEERING & MFG. CO.

1056 HULBERT **CINCINNATI, OHIO**

from machine parts, stampings, and other manufactured products.

Batch type machines are available as well as large continuous conveyor and monorail-spray types to incorporate such sequences of operations as wash and rinse; or wash, rinse and dry, or special processes for the surface treatment of metals. The machines are said to be suitable for solvent-emulsion degreasing or alkali cleaning. Drying is accomplished with a high efficiency recirculating air system. Machines are steam, gas, or electrically heated and can be supplied complete with controls.

Ralph E. Kramer Made General Manager of Suprex Gage Company

The appointment of Ralph E. Kramer, former Chicago industrial marketing and sales executive, to general manager of Suprex Gage Company, Ferndale, Mich., has been announced by N. A. Woodworth, president. A graduate of Carnegie Institute of Technology, Mr. Kramer formerly was president of H. Channon Company, Chicago, large distributors of industrial supplies, tools, machinery and equipment. He is also currently vice-president of the National

Ralph E. Kramer

Association of Supply and Machinery Distributors.

Among his first duties as general manager, Mr. Kramer is completing a new program to provide emergency service to vital war industries requiring immediate deliveries of quality precision thread and plug gages and special cutting tools. Suprex, itself, is engaged 100 per cent in war production.

SPECIFICATIONS!

+

PLUS

Adaptation of formulae to the individual requirements of busy war contractors.

Within specification limits there are many possibilities of improvement in speed, workability, and freedom from rejects.

This PLUS factor is worth considering. We'd like to tell you more about it.

The Varnish Products Co.

Cleveland, Ohio

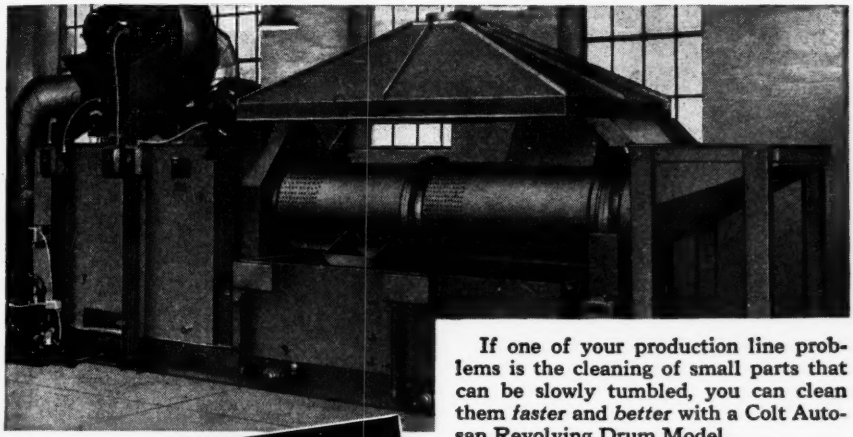
American Standards Association Appoints Two Committeemen

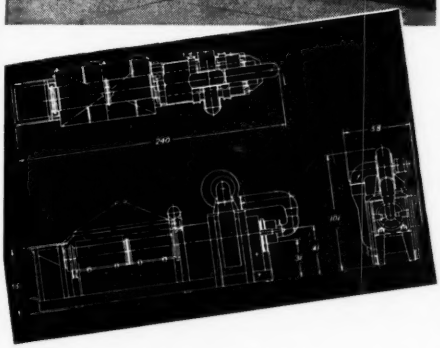
W. Mikelson of the General Electric Company, Schenectady, N. Y., and A. M. Swigert, master mechanic of the Chrysler Corporation, Detroit, have been appointed members of the Sectional Committee on Classification and Designation of Surface Qualities of the American Standards Association. The scope of the committee is to classify and designate surfaces according to quality of surface.

War is Hell — but slavery would be worse. We can't all go to the front, but we can send our dollars to fight for us by buying Victory Bonds. Buy a Victory Bond today.

Up to 75 CU. FT. PER HOUR

. . . that's fast washing, rinsing and drying!





If one of your production line problems is the cleaning of small parts that can be slowly tumbled, you can clean them *faster* and *better* with a Colt Autosan Revolving Drum Model.

Model 282, shown here, is speeding up wartime production in many plants – washing, rinsing, and drying airplane parts, cartridge cases, bullet cores, and other small parts – at a speed ranging from 20 cubic feet to as high as 75 cubic feet per hour, depending on the nature of the job and the size of the parts.

For a variety of cleaning operations or combination of operations, Colt can supply standard or special-built Autosan Machines for the job. Just write us – describing the kind, size and quantities of parts to be cleaned – the various operations required. We'll recommend the type of Autosan best suited to your needs.

WRITE TODAY for a copy of the catalog describing the standard Autosan models.

COLT'S PATENT FIRE ARMS MFG. CO., HARTFORD, CONN.

COLT AUTOSAN METAL PARTS CLEANING EQUIPMENT

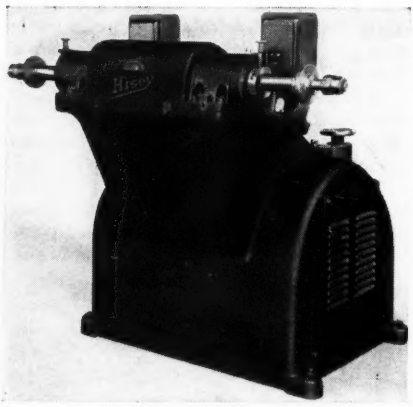
New PLANT EQUIPMENT AND Materials

Hisey-Wolf Heavy Duty Polisher and Buffer

A new heavy duty polisher and buffer has been developed by The Hisey-Wolf Machine Co., 2745 Colerain Ave., Cincinnati, Ohio. By mounting the motor inside the base, it is possible to use standard open motors instead of totally enclosed, fan-cooled motors, thus a corresponding saving in scarce materials is made possible.

The Hisey-Wolf Heavy Duty Polisher and Buffer is built in two types; one with single spindle—single motor, the other a two spindle—two motor type. These polishing and buffing machines can be equipped with motors having 3 to 10 h.p. capacity. According to the manufacturer, oil lubrication requiring minimum attention is obtained through the use of constant level type oilers. This lubricating method is considered a feature of these machines.

Although the illustration shows open type spindles, the encased type can also be furnished with a housing about the spindle extension and with ball bearing directly adjacent to the wheel.



Hisey-Wolf Heavy Duty Polisher and Buffer

Turco Duramask

A new floor masking material to be known as Turco Duramask, developed to speed up the time-wasting job of removing accumulated spillage and overspray from paint room floors, has been placed on the market by Turco Products, Inc., 6135 S. Central Ave., Dept. 54, Los Angeles, Calif. This white, thick liquid looks and is handled much like paint. It can be applied to the floor with a kalsomine brush. It is said to quickly dry to a hard, durable, non-skid surface which cannot be injured by ordinary foot or truck traffic.

When the accumulation of paint on the protective coating is so great as to require its removal, the Turco Duramask can be dissolved with water and the paint film can be mopped away. Turco Duramask can also be used to protect machinery, walls, work benches and other surfaces from paint, oil, or grease spillage. It is an excellent protective floor covering for garages, grease racks and machine shops. Lubricating oil, grease and machining oil are caught on the coating and prevented from seeping into the porous cement or wood floors. At intervals the spillage can be

removed simply by mopping off with water. Turco Duramask is said to be non-corrosive, non-flammable and is not injurious to the skin.

Turco Duramask can be painted on the floor. When the accumulation of paint is so great as to require its removal, it can be safely, easily, and rapidly washed with water. Turco Duramask is said to form a surface so durable and so easily removable that it makes an ideal shop coat for the temporary protection of materials while moving through the factory or while being stored. It can be used on airplanes and cabinets, for example, where a harder surface is needed than that provided by ordinary protective coatings, and where the surface must be protected from finger marks. It can be written upon with an ordinary lead pencil. Inspectors can mark it with rubber stamps or dimensions can be layed out on its surface.

Triple Basket for L & R Industrial Cleaning Machine

L & R Manufacturing Company, 54 Clinton St., Newark, N. J., has announced the development of a triple basket which fits snugly into the regular work basket (3⅜-in. depth x 5½-in. diameter) of the L & R Industrial Cleaning Machine, making it possible to clean different types of parts individually and at the same time run them through the machine together. The basket is made of fine mesh which will hold the most minute parts without the danger of their slipping through the mesh and becoming mixed with other elements.

This feature is said to be particularly important to producers of jewels, jewelled bearings, ball bearings, instruments, meters, watches, clocks, and others who manufacture parts which must be examined under microscopes for cleanliness. The triple nesting baskets are also convenient for cleaning three larger parts which the operator wants to handle individually. The manufacturer claims that because of the centrifugal action of the basket in the cleaning compounds there is never any danger, once the contamination has been removed, of the foreign matter returning into the basket and affecting other parts. It is said to provide a foolproof method of handling parts that are too delicate for manual cleaning.

The cleaning compounds used in the machine are said to affect metal in no way and to polish parts to a brilliant luster. After the complete cleaning cycle, the parts are taken from the work assembly. It is claimed that L & S

Triple Basket for L & R Industrial Cleaning Machine

baskets thoroughly dry and ready for solutions are safe, having a flashpoint of approximately 115 deg. F., and are non-toxic. Many plants are now employing women for this type of cleaning because of their natural aptitude in the care of delicate apparatus and parts, and because the method of operating the L & R Industrial Cleaning Machine is easily and quickly learned.

ANTI-SPATTER

Welding Aid

Eliminates Metal Finishing

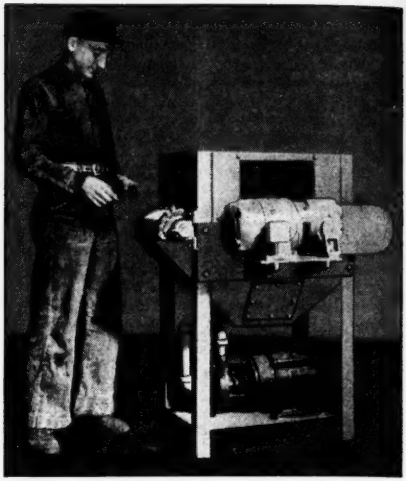
INDUSTRIAL CHEMICAL PRODUCTS CO.

DETROIT

Milwaukee **Fort Wayne**

Industrial Ball Bearing Washing Machine

Industrial Washing Machine Corporation, 291 Burnet St., New Brunswick, N. J., has placed on the market a washing machine designed for washing small parts. This machine is said to be very compact and measures 2 ft. 6 in. by 2 ft. 11 in. It is designed to wash parts varying from $\frac{1}{8}$ in. in diameter up to parts 6¾ in. wide and 2¾ in. high. The unit has a constant speed of 32 ft. per minute which provides a capacity of 16 sq. ft. of work per minute.



Industrial Ball Bearing Washing Machine

The pump on the Industrial Small Ball Bearing Washing Machine delivers a pressure of approximately 25 pounds per square inch. The machine is de-

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Nalco Dritherm Lamps are the carbon filament type...proved for years in therapeutic and industrial practice as providing maximum emanation of infra-red ray within the desirable penetration band. Made only by—
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PRODUCTION LINE METAL CLEANING ...*Calls for the Right Machines, Methods and Materials*

Effective cleaning at mass production rates is just as dependent on adapting the cleaning material and method to a particular operation as it is on the design of a special washing machine properly geared into the production line.

MAGNUS OFFERS YOU ALL THREE — PLUS

1. A complete line of specialized metal cleaners. 2. Years of research in the development of cleaning methods. 3. Wide experience in designing and building special metal washing machines to meet individual requirements. PLUS: *Quick* service, particularly in delivery of machines. If you want to speed production and solve man-power shortages by fitting your cleaning operations into the production line, call on Magnus for the complete, coordinated service that insures quick results and better cleaning.

Write now for your copy of the new Magnus "Metal Cleaning Handbook" — the first complete manual on materials, methods and machines for metal cleaning.

MAGNUS CHEMICAL COMPANY
Manufacturers of Industrial Cleaning Materials—Washing, Drying, Pickling Equipment—Metal Drawing Lubricants. Also Methods Engineering Service.
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MAGNUS CLEANERS

Facts about Metal Polishing

The Preparation and Conditioning of the Polishing Wheel

1. The Polishing Wheel must be in Balance

The polishing wheel should always be put in balance before use to avoid bumping and excessive dressing. This will give longer wheel life, a better finish on the metal and less wear and tear on the polishing machine itself. The wheel bushing should be a good fit on the machine spindle in order that the wheel will run perfectly true.

2. The Wheel should be True

To true the wheel, remove the grain and adhesive with an abrasive brick or the end of a one-inch pipe. After this is done, the face of the wheel should be put in truth with a sharp tool. A tool suitable for this work can be made from an old file.

3. "Sizing" the Wheel

A common method is to "size" the wheel and hang it up to dry. It is then placed on the lathe at running speed and the face rubbed lightly with a fine abrasive brick. This will raise the nap slightly and the coat of abrasive and adhesive will stick better.

4. Cracking or Breaking up the Wheel Head

Use a round bar or pipe and hit diagonally across the wheel face. Do this completely around the wheel one or two times, striking the wheel face at about a 45° angle. Then hold the wheel so that the bar will fall across the face at an angle and form an "X" with the first series of cracks. In many plants sharp tools are carelessly used, resulting in chips being torn from the wheel face, which shortens the life and reduces the efficiency of the wheels.

5. Direction of Wheel Rotation

When a new canvas, muslin or felt wheel is trued, a nap is laid back on the face of the cloth. In order to keep this nap lying in the same direction, the wheel should be mounted on the spindle to keep direction of wheel rotation always the same. When a polishing wheel is rotating in the wrong direction it is equivalent to stroking a fur the wrong way. Such a wheel generally gives a short life, as the abrasive breaks out readily. Paint an arrow on the side of all wheels to indicate how they should rotate.

NORTON COMPANY, Worcester, Mass.

G-148

NORTON ABRASIVES

signed to wash with a cold solvent solution. However, a heated alkali solution may be used and for cleaning by this method, a steam injector is provided.

Motors and pumps are mounted on the machine which is said to be ideally suited for the very small plant which is now manufacturing small items such as fuse clips or on any small part where washing is a primary requisite.

American-LaFrance-Foamite Extinguisher for Incendiary Bomb Fires

In conformance with the Emergency Requirements of the United States Government, the American-LaFrance-Foamite Corporation, Elmira, N. Y., has designed a new pump tank with the amount of critical materials in its manufacture reduced to a minimum.

This new pump tank produces a straight stream and not a spray. This is said to be in compliance with the latest requirements of the Office of Civilian Defense for controlling magnesium type incendiaries.

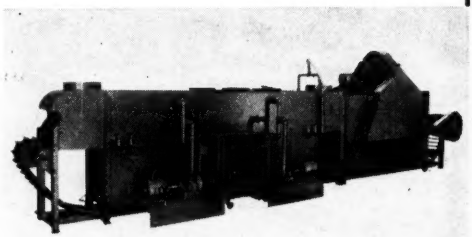
The new pump tank is made in 5 gal. and 2½ gal. sizes. It has an over-sized air chamber, assuring minimum pulsation, a steady pressure and a more constant stream. It has a range of 30 to 40 feet. It is a self-contained unit and

American-LaFrance-Foamite Extinguisher for Incendiary Bomb Fires

ENGINEERED *for* SPEED

METAL WASHERS
DEGREASERS
PICKLERS
QUENCHERS

BLAKESLEE *engineered-for-you* washers and degreasers are *engineered for speed.* To insure your production, to guarantee clean products, and to meet the top production required by war needs, your problems are considered from every angle. Every factor is considered to give perfection in your washing and degreasing operation.



The above machine is a Blakeslee double tank, wash, rinse, blow-off and steam recirculatory air type dryer. The machine is designed especially for washing machine castings for a 24-hour day.

G. S. BLAKESLEE & CO.

NEW YORK CHICAGO TORONTO

Stop Off— for all plated metals

Now you can stop off any plated metal either in acid or alkaline solution . . . Just two BUNATOL quick drying chemical resistant Stop Offs will meet every plated need . . . No. 474 RED for hard Chromium and any acid solution . . . No. 608 BLACK for cyanide Copper, Tin, Silver, Zinc or any alkaline solution.

Easy to apply; brush, dip or spray . . . Fast drying . . . Great adhesion and easy to remove . . . Trims easily and holds on the trimmed edge . . . No plate through . . . Not tonic . . . May we send you samples? . . . Just write . . .

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BUNATOL

can be readily transported up ladders, over roofs and to points difficult of access.

It is equipped with a standard 26-in. hose and its interior has a corrosion-resisting coating. The outside finish is of red enamel also designed to repel corrosion and to make its identity immediate.

Both sizes are approved by the Underwriters' Laboratories with a Class A-1 rating, under the Emergency Alternate Specifications.

Bunatol Anodizing Rack Insulant

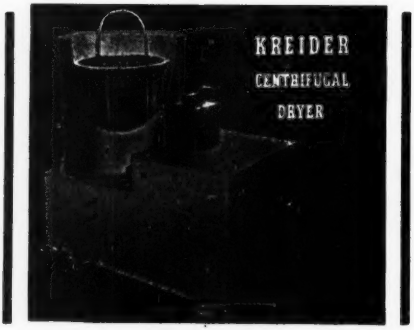
A new anodizing rack insulant known as Bunatol has been placed on the market by Nelson J. Quinn Company, 421 Thirteenth St., Toledo, Ohio. This new development is said to multiply rack life, reduce rejects to a minimum, and reduce current consumption to what the work requires. One of the important characteristics of Bunatol is said to be its permanent flexibility.

Illustrated herewith is a typical spring-clip type anodizing rack, Bunatol-insulated. This tough, adhesive coating is said to provide a flexibility in keeping with that of the spring-clips themselves and does not become brittle, crack, or peel when the clips are flexed. Because this flexibility is retained for the life of the insulation, it is said to retain its efficiency and provide maximum rack protection until the contacts are entirely eaten away.

It is claimed that Bunatol has already been adopted by many large production shops where anodizing rack life has been so prolonged that its users are not yet able to state specifically just how greatly rack life has been increased.

Bunatol-Insulated Anodizing Rack

SPEED DRYING WITH EASILY OPERATED



Cuts Cost and Improves Quality of Plated Work

One worker can easily operate this modern high-speed drying outfit. Electric welded, all-steel construction. V-belt drive. ¾ H.P. motor for efficient, economical operation. Controls include fast-acting foot brake and reversing drum switch. *Auxiliary heating unit available.*

Write for complete information and prices.

DELLINGER MFG. CO., 729 N. Prince St., Lancaster, Pa.

Protectite

J. Merrill Richard, 25 Huntington Ave., Boston, Mass., is now marketing an anti-corrosion and heat-resistant industrial paint to be known as "Protectite." The paint embodies a hard calcined carbon-silicate complex pigment which is said to be exclusive with the manufacturer. This pigment is inert provides a dense, pliable and waterproof coating free from pin holes. It is resistant to corrosive atmospheres, acids, and alkalis, and will withstand temperatures developed in modern power plant equipment.

The paint is furnished, ready for use, in black and battleship gray colors. It can be applied by gun, brush or dipping. Protectite is used for general

For a real good polishing job use

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TURKISH — NAXOS — AMERICAN

KEYSTONE EMERY MILLS *Write for Sample* 4316 Paul St., Phila., Pa.

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Dopes
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Lacquers • Enamels
and Thinners

Are meeting today's demands under the stress of war conditions.

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•

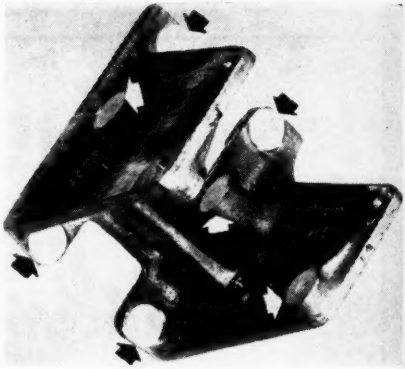
R A N D O L P H
FINISHING PRODUCTS CO.

Carlstadt **New Jersey**

maintenance, protection of machinery and equipment, on hot materials such as stacks, boilers, pipes, and so on, and especially where surfaces are exposed to corrosive elements. The hard pigment is said to make it suitable for finishing products and floor coating.

Kum-Kleen Masks

A new method of masking has been developed by the Avery Adhesives, 451 E. Third St., Los Angeles, Calif., which is said to be particularly effective when the masking area is small. The masks employed are to be marketed under the trade name of "Kum-Kleen."



Kum-Kleen Masks

Kum-Kleen Masks have a self-adhesive backing and after the operation is completed, they may be peeled off without scraping or tearing. They may be quickly applied, without moistening, to metal, glass, plastic, or any smooth surface.

While standard sizes of Kum-Kleen Masks will fit many normal masking jobs, special sizes and shapes are made to specifications. Much time is saved in having a mask cut to the exact requirements.

Gunk P-96 Degreasing Solvent

Curran Gunk P-96, concentrated self-emulsifying degreasing solvent, is claimed to be valuable for its ability to dissolve, emulsify, and remove heavy accretions of Bunker "C" fuel oil in the presence of salt water. The outstand-

-for Fast-Finishing

"INDIAN BRAND" POLISHING ABRASIVE

For nearly forty years we have been producers and refiners of abrasive grains, serving the industry with a strictly quality product for all particular abrasive applications. Accurately Graded — Thoroughly Cleaned — Greater Capillarity — Longer Wear.

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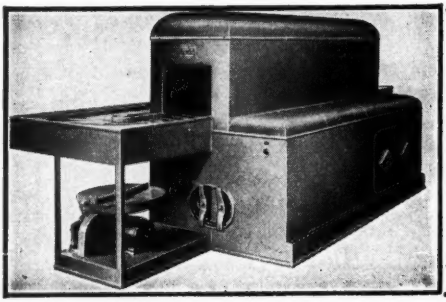
THE HAMILTON EMERY & CORUNDUM CO.

Chester, Massachusetts



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Industrial Washing Machines

Streamlined design. Hidden motors, pumps and pipes are easily accessible. Piping and nozzles located to insure thorough cleansing of all surfaces. Rugged and efficient pressure pump. Corrosion resistant spray nozzles—from mist to open stream. Monorail, Belt or Gravity type conveyors designed to carry any shape or size material. Variable speeds on conveyor drive synchronize production.

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Write for circular.
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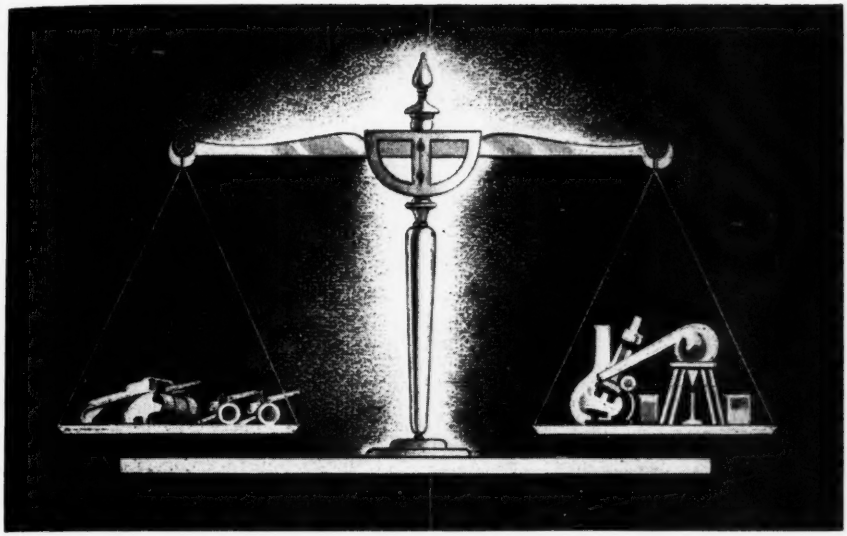


In the balance . . .

Chemical engineering is producing literally hundreds of amazing new products and processes as its contribution to the winning of the war. Just what some of these developments are you may not know until the war is over . . . for they are military secrets. But, once the war is won, you will feel their full impact in your plant, your product and your sales. It is important that you keep pace with this technological advance. For example: finishing. Probably no one sales point is more important to your product, or more vital to your sales. And certainly no one point has, during the past year, received more expert attention. It is our business to discover better ways to finish products . . . to cut finishing time, to lower finishing costs, to improve appearance and utility, and by these means to increase sales and profits for your product. Your inquiry will incur no obligation. Address The Stanley Chemical Company, East Berlin, Connecticut.

Stanley Chemical

ing feature of this new colloidal emulsifying solvent is, according to the manufacturer, that the degreased surfaces are particularly compatible for the application of red lead undercoat.

It is claimed that because of the powerful penetrating and emulsifying action, all traces of oil are made water soluble and need only be sluiced with a water hose to rinse and decontaminate large areas such as the hold of warships. Gunk P-96 is a product of the Curran Corporation, Malden, Mass.

Mixing Equipment Heavy-Duty Air Driven Mixers

Mixing Equipment Company, 1038 Garson Ave., Rochester, N .Y., recently announced the addition of three new heavy-duty air driven mixers to its regular line. Two of the new mixers are gear reduction models. The third is a larger direct drive model.

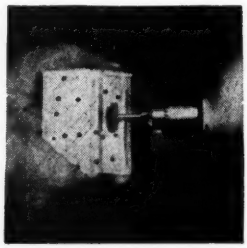
The important features of these mixers

Mixing Equipment Heavy-Duty Air Driven Mixer

are said to especially adapt them to the mixing of paints, chemicals, high explosives, and alcoholic compounds. According to the manufacturer, the air driven motors used in these mixers cannot be overloaded or burned out and when the mixers are used in the heaviest liquids, they will not stall. The air exhaust from the motor is so arranged that it keeps the motor running cool at all times.

Models of 1 h.p. and ½ h.p. are available. They are equipped with gear reduction drive and adjustable shaft length.

De-burring and finishing holes and edges in Alclad part with Brightboy Wheel.



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DE-BURRING • FINISHING • POLISHING

Because

"The Soft Rubber Binder Cushions The Abrasive"

Brightboy bridges the gap between a grind and a buff. Ready for immediate use. Made in wheels, blocks, sticks, rods and special shapes. Information and prices from your dealer or

BRIGHTBOY INDUSTRIAL DIVISION
Weldon Roberts Rubber Co., Newark, N. J. U.S.A.

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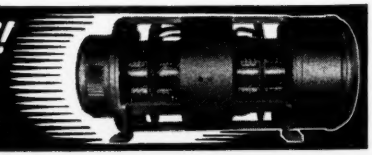
BETTER PLATING, LESS COST!
"MGC" ELECTROPLATING EQUIPMENT
Write for Interesting Details TODAY!
MOTOR GENERATOR CORP., HOBART SQ. BOX PF23 TROY, OHIO



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Get This Flag Flying Now!

This War Savings Flag which flies today over companies, large and small, all across the land means *business.* It means, first, that 10% of the company's gross pay roll is being invested in War Bonds by the workers voluntarily.

It also means that the employees of all these companies are making a definite contribution to Victory . . . by helping to buy guns, tanks, and planes that America and her allies *must* have to win. And it means that billions of dollars will be held in readiness for post-war readjustment.

Think what 10% of the national income, saved in War Bonds now, month after month, can buy when the war ends!

For Victory today . . . and prosperity *tomorrow,* keep the War Bond Pay-Roll Savings Plan rolling in *your* firm. Get that flag flying now! For full details, plus samples of result-getting literature and promotional helps, write or wire: War Savings Staff, Section F, Treasury Department, 709 Twelfth Street NW., Washington, D. C.

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GLOBE
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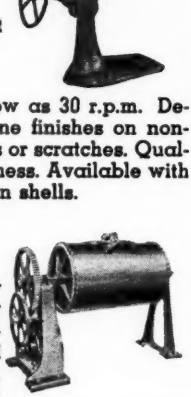
BARRELS

The Globe complete line of finishing tumbling barrels has had the acceptance of industry for more than 40 years.

GLOBE DIRECT MOTOR DRIVE, TILTING, TUMBLING BARREL.

(Right)—Speeds as low as 30 r.p.m. Developed to produce fine finishes on non-ferrous parts. No nicks or scratches. Quality built with compactness. Available with wood, steel or cast iron shells.

No. 6 HORIZONTAL FOUNDRY BARREL.



(Right) — Ruggedly constructed for heavy duty work such as removing fins and flanges from castings. Available in varied sizes with tight and loose pulleys or motor drive as shown.

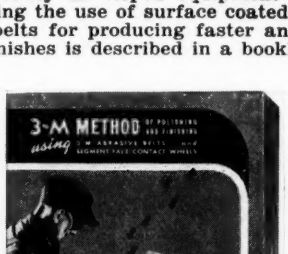
COMPARTMENT BURNISHING BARREL.

(Right) — Performs up to three jobs at once, speeding production. Exceptionally strong and durable. Large door opening facilities loading and unloading. Belt or motor driven.

FREE! Globe's new illustrated catalog P-6 is yours for the asking. Packed full of interesting information, it demonstrates how you can slash your finishing costs. Write today!

THE GLOBE MACHINE & STAMPING CO.
1200-1250 WEST 76TH STREET
CLEVELAND · OHIO

3M Method of Polishing and Finishing. Newly developed equipment incorporating the use of surface coated abrasive belts for producing faster and better finishes is described in a booklet re-



3 M Method of Polishing and Finishing

cently released by Minnesota Mining and Manufacturing Company of Saint Paul, Minnesota.

The method consists of the use of a backstand idler unit, utilizing a newly perfected segment face contact wheel and surface coated abrasive belts. One's present lathe or setup equipment can be used or a complete backstand idler unit acquired for this work.

There are three types of segment face contact wheels that increase the range of work with surface coated abrasive belts by providing a hard, flat surface for driving the belt but with a soft center so that irregular shaped pieces can be finished. This equipment is proving a decided timesaver for grinding, finishing or polishing a wide variety of pieces.

The segment face wheel using surface coated abrasive belts is also incorporated into a swing grinder for sanding billets, bars and tubes. Pedestal mounted or suspended from overhead rail, it is effective for repair grinding, beveling and surface grinding and is described and illustrated in this booklet.

If your finishing room is "bottled" up with work and increased production is demanded, it will pay you to write for this booklet. It is offered on request to any firm interested in pushing production. Just address your request to Minnesota Mining and Manufacturing Company, Saint Paul, Minnesota, Department NR1242.

Oakite Cleaning Materials and Methods in the Aviation Industry. Essential production degreasing and maintenance cleaning required in aircraft and accessory manufacturing plants are thoroughly reviewed in the second edition of a newly revised, enlarged, 40-page manual published by Oakite Products, Inc. Describing new developments in handling over 43 important, commonly recurring degreasing and cleaning operations, the booklet is of particularly timely interest both to those executives responsible for the various types of work in which cleaning is an integral part and to the men charged with the actual performance of cleaning.

The manual gives practical data on the uses of tank immersion, washing machine, acidic, solvent, steam-detergent and pressure-spray methods for handling various degreasing and cleaning operations. Among those operations discussed are safely preparing aluminum alloy parts before such fabricating operations as heat treating, Magna-flux testing, pickling, inspection and assembly; rust-proofing parts between operations; cleaning aluminum, magnesium and their alloys before anodizing or other protective chemical surface treatment, and degreasing work preparatory to electroplating, painting, black finishing, and so on.

A free copy of this helpful, informative manual will be sent upon request. Write to Oakite Products, Inc., 20 Thames St., New York, N. Y.

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Most Congenial Hotel

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To obtain copies of the catalogs listed here, indicate on the coupon the number of the item in which you are interested and mail as directed.

1. Howard Cleaning and Finishing Equipment

A 33-page catalog which describes and illustrates 28 types of widely adaptable product finishing equipment is now being issued by the Howard Engineering & Manufacturing Co., 1056 Hulbert St., Cincinnati, Ohio.

2. Metal Cleaning Check Chart

Quick help on the correct solving of metal product cleaning problems is offered through a simple check chart analysis sheet, recently prepared and now being distributed by The Hunnewell Soap Co., 116 W. Second St., Cincinnati, Ohio.

3. Sturdy-Bilt "Simplex" Metal Parts Cleaner

The Sturdy-Bilt Equipment Corp., Dept. P-11, West Allis, Wis., is now issuing a folder describing the features of Sturdy-Bilt "Simplex" metal parts cleaning equipment.

4. Johnson Wax-Fortified Paints

A 12-page catalog now being issued by S. C. Johnson & Son, Inc., 1012 Sixteenth St., Racine, Wis., explains the purpose of War-Fortified Paints, what makes them economical, and where they are used.

5. Speed Production

A booklet containing information about a new technique of grinding, finishing, and polishing that offers increased production to finishing departments is now being issued by Minnesota Mining & Mfg. Co., Forest and Fanquier Sts., St. Paul, Minnesota.

6. Metal Cleaning Equipment

A four-page folder which illustrates and describes a well-rounded line of equipment for cleaning war products such as cartridges, gun barrels, shells and similar products is now being issued by the Alvey-Ferguson Company, 162 Disney St., Cincinnati, Ohio.

7. New Wrinkles in Finishing

Vol. 4, No. 6 of this publication contains pertinent information on the application of Wrinkle Finishes marketed by New Wrinkle, Inc., 314 W. First St., Dayton, Ohio.

8. Centrifugal Compressors

A 20-page catalog, which illustrates and describes Design 9 Centrifugal Compressors for application wherever blowers for small capacity work are required, is now being issued by the B. F. Sturtevant Company, 16 Damon St., Hyde Park, Boston, Massachusetts.

9. Dresinate for Extra-Action Metal-Cleaning Compounds

The Hercules Powder Company, Inc., Delaware Trust Bldg., Wilmington, Del., is now issuing an eight-page catalog, telling how the Dresinate method of metal cleaning will help prevent cleaning baths from becoming bottlenecks in the production line.